



Thanks for maintaining a desktop environment

But is it accessible?

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Slides & stuff on

<http://wiki.debian.org/accessibility-maint>

<http://liberte0.org/>

<http://hypra.fr/>

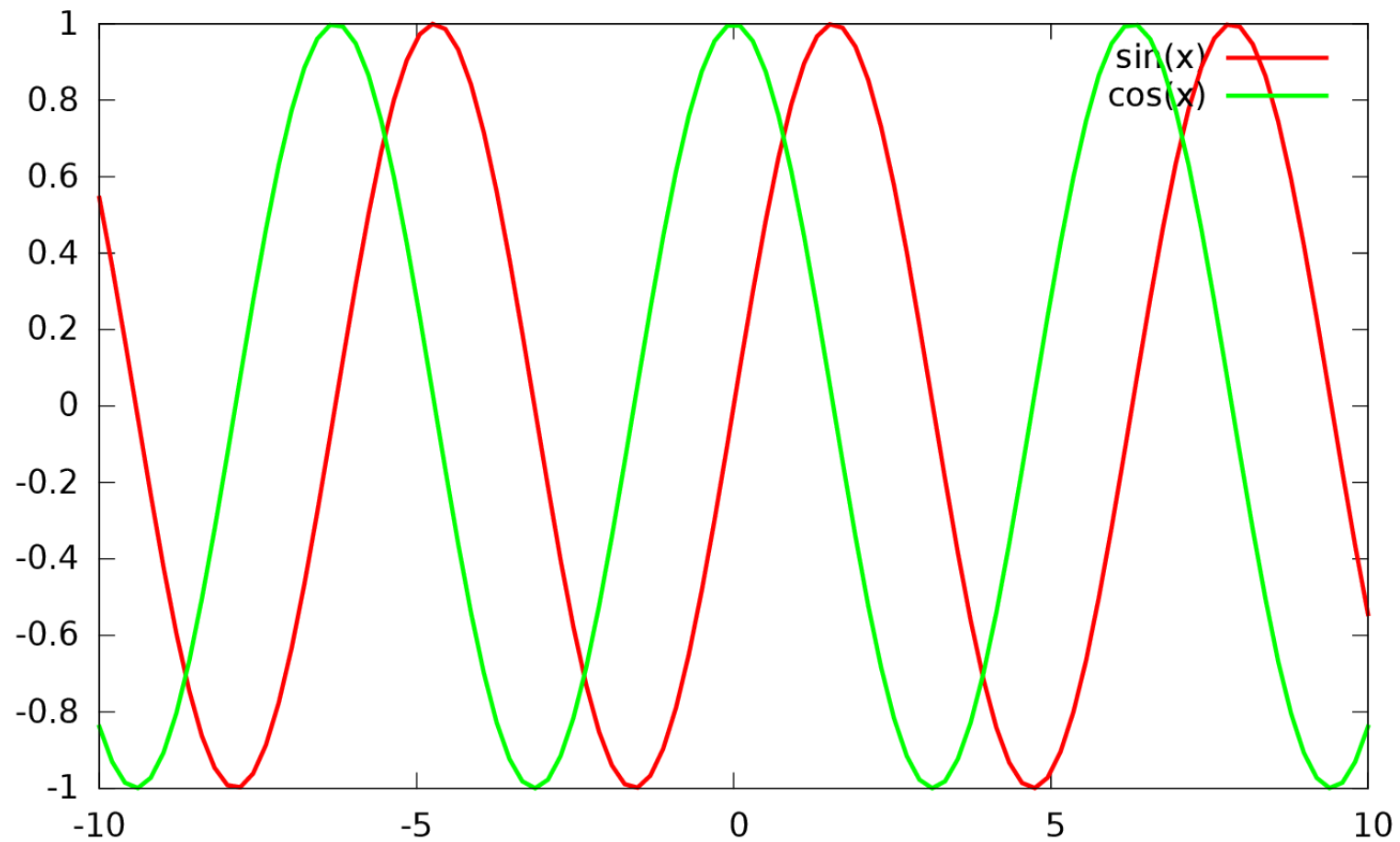


Outline

- Introduction to accessibility
- Accessibility stack
- CHECKME list for desktops



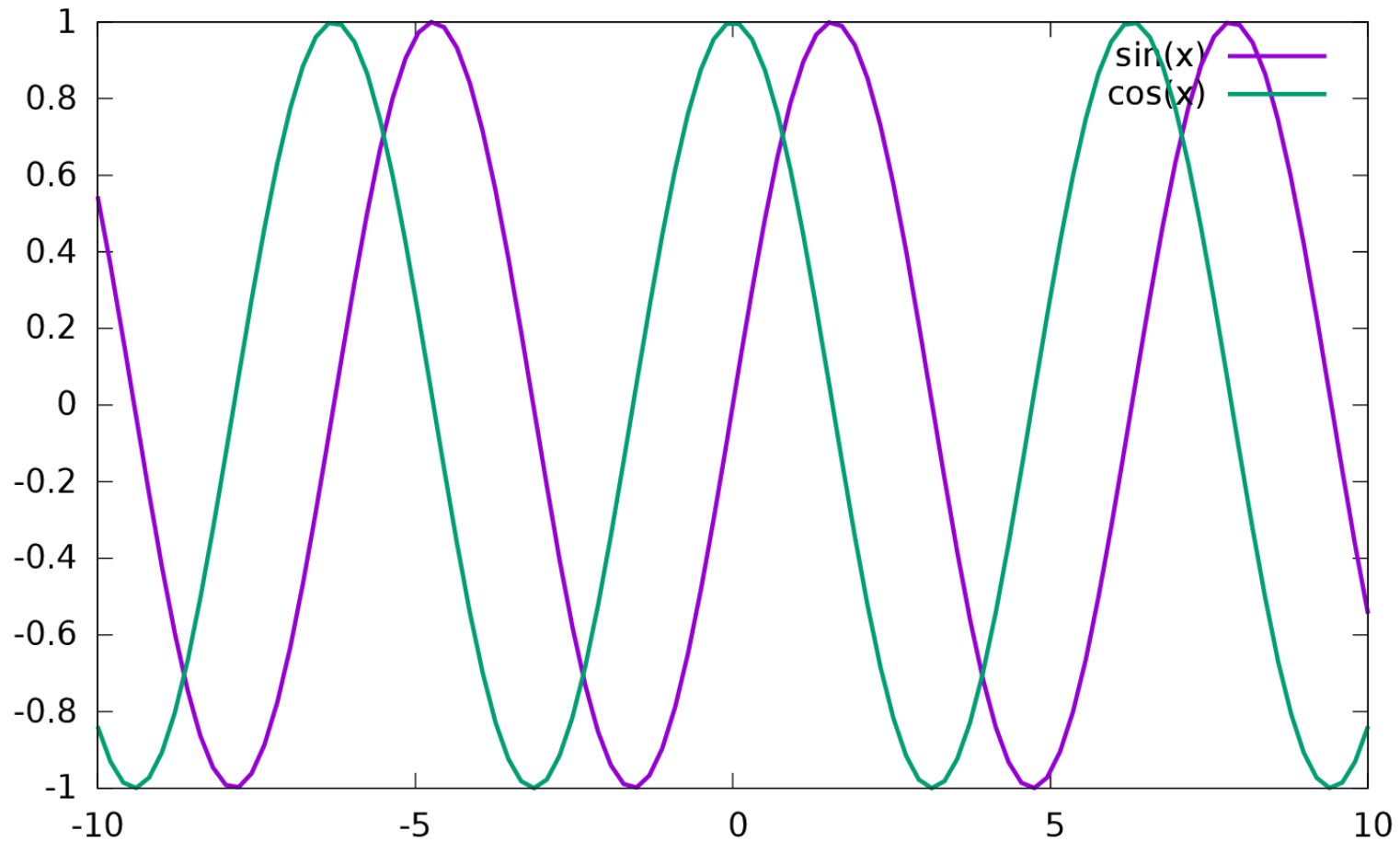
Gnuplot



Color blindness: 8% male, 0.5% female



Gnuplot 5!!



Color blindness: 8% male, 0.5% female



What is accessibility?

AKA a11y

Usable by people with specific needs

- Blind
- Low vision
- Deaf
- Colorblind
- One-handed
- Cognition (dyslexia, attention disorder, memory, ...)
- Motor disability (Parkinson, ...)
- Elderly

See Accessibility HOWTOs

- You

“Handicap” depends on the situation
and is not necessarily permanent
10% handicapped – 20% limited



This is all about freedom #0

“The freedom to run the program, for any purpose”

What about being *able to use* the program?

- RMS said a11y was just a “desirable feature”.
 - “Desirable” only, really?
- RMS said “this is free software, you can modify it” (freedom #1)
 - Can. Not. Happen.



UNO rights of persons with disabilities

"Discrimination on the basis of disability" means any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation

"Reasonable accommodation" means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms;



A question of priority

- Should be prioritized
 - Just like internationalization



A question of who doing it

- Concerns only a small fraction of population
 - Already a hard time using computers...
 - Almost nobody with both disabilities and programming skills (and very difficult to work)
 - Even fewer people with awareness and programming skills
 - “This is free software, you can modify it” can not work.
- Support has to be integrated
 - Distributed among maintainers themselves
 - Not borne by the tiny a11y community



Hardware



Hardware

- Braille input/output
- Speech synthesis
- Joysticks
 - Basically replace mouse
- Press button
 - On-screen virtual keyboard
- Eye-tracking
- ...

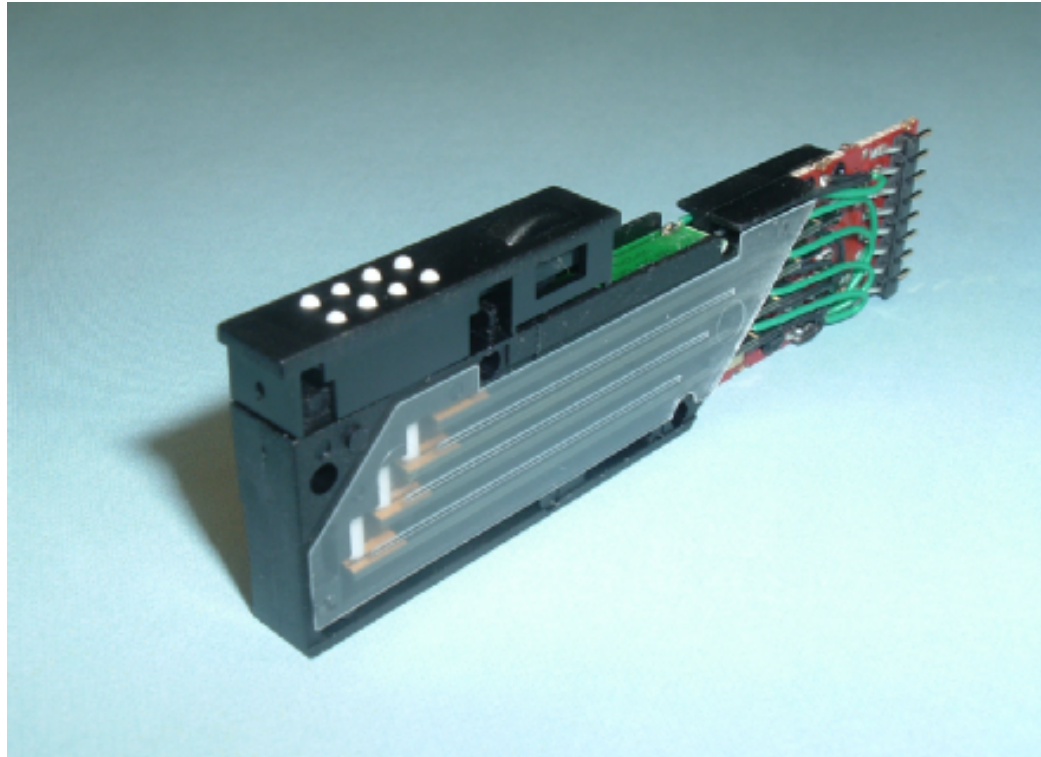
Don't focus on one technology

Even for a given disability, e.g. blindness:

- Braille is not perfect
 - A lot of blind people can't read braille
 - Braille devices are very expensive (several k€)
- Speech synthesis is not perfect
 - Noisy environments
 - Tedious for spelling issues



Piezo braille cell



- Usually 8 dots \sim = one character
- Piezoelectric effect to move up/down



Braille devices



- Serial, USB, bluetooth connection
- 12 / 20 / 40 / 80 cells, price $\approx 150 \cdot n$ €



Software interfaces

Why making GUI accessible?

(when textmode seems so easier to make accessible)

- A lot of stuff is not available in textmode
 - e.g. real javascript support
- Business applications
- Non-tech people need to get help from non-tech people around



Dedicated software?

- e.g. edbrowse, a blind-oriented editor/browser
- Generally a bad idea!
 - Oriented to just one disability
 - Lack of manpower
 - e.g. Web browser
 - javascript/flash/table/CSS support?
 - e.g. An office suite
 - MSOffice/OpenOffice compatibility?
 - Disabled & non-disabled working together
 - Better use the same software

→ Better make **existing** applications accessible ²²



The specialized distribution trap

There shouldn't be specialized distributions

- Accessibility is orthogonal to any other concern
 - It's orthogonal to blends and tasks
 - Users should be able to choose blend&task
- All (music, medicine, teaching, ...) distributions should be accessible
- Specialized distros tend to be specific
- Specialized distros are interesting testbeds, though



Graal: accessibility everywhere

- Using a computer at the library, the airport, the university practice room, etc.
 - First ask admin to install & configure software?!
- Installed by default, ready for use
 - Requires very close integration
 - E.g. support in Debian Installer



Design principles

- Same software, made accessible
 - Understand each other, get help, etc.
- Synchronized work
 - Just alternate input/output
 - Being able to work together
- Pervasive
 - Shouldn't have to ask for software installation / configuration



Now the real stuff

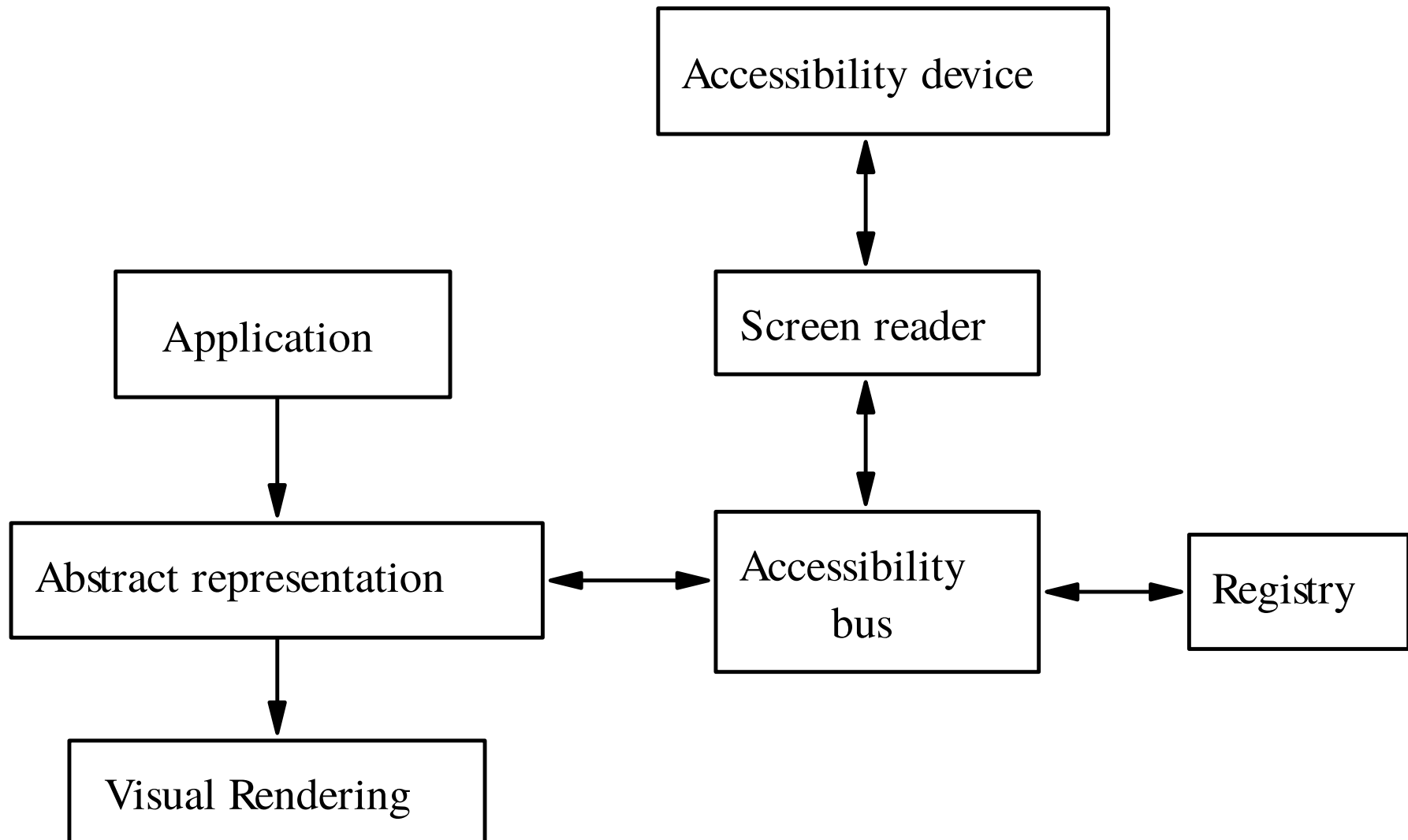
Status, how it works, CHECKME



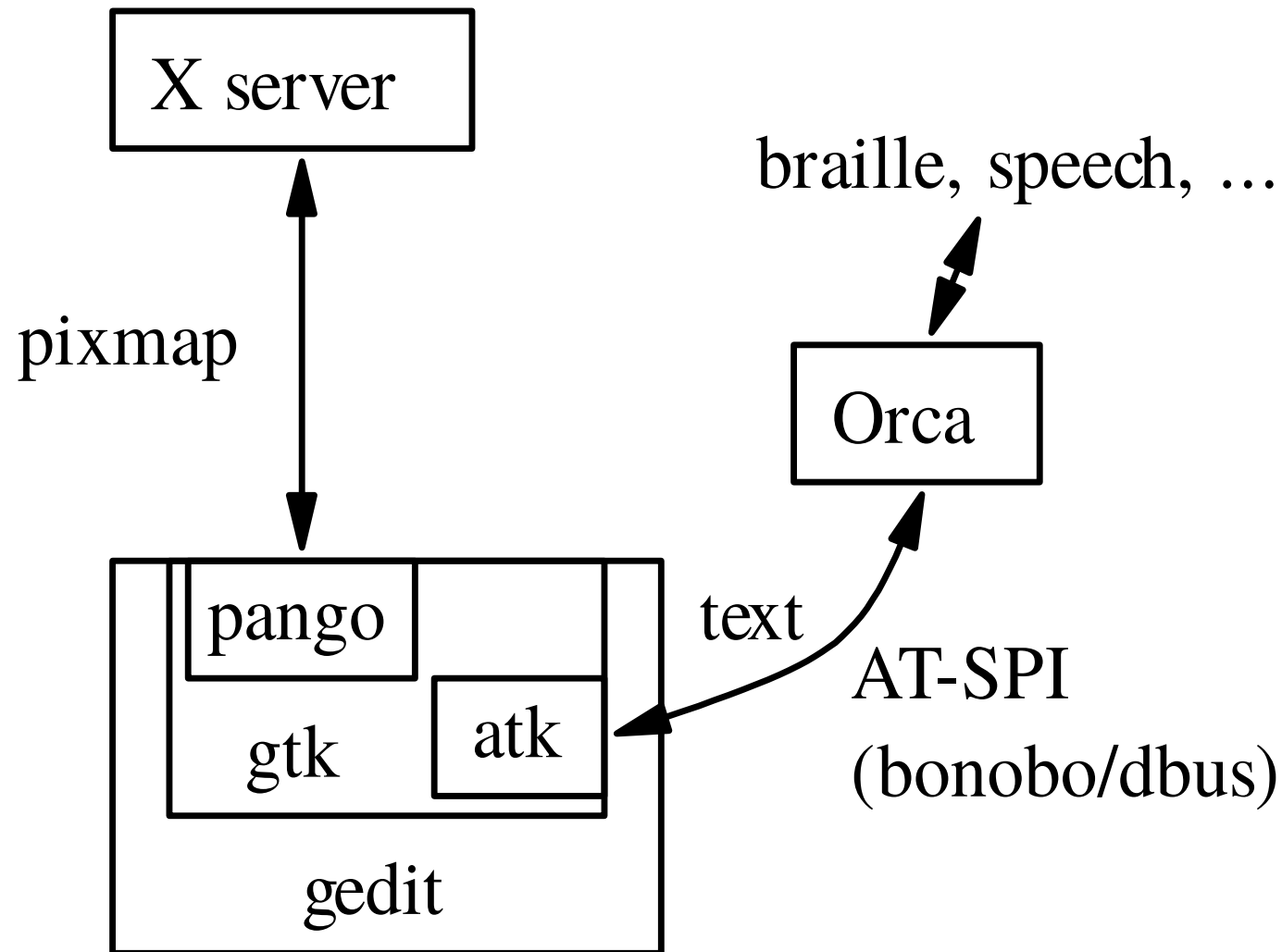
Status in a few words

- Text mode is generally quite well accessible
 - But not so well suited to beginners
- Gnome quite accessible
 - Gnome 3 was however almost a restart-from-scratch
- We're late compared to the Windows world
 - We started less than a dozen years ago
 - They started a couple of decades ago
- We're Stone Age compared to the Apple world
 - Really *good* and *integrated* support

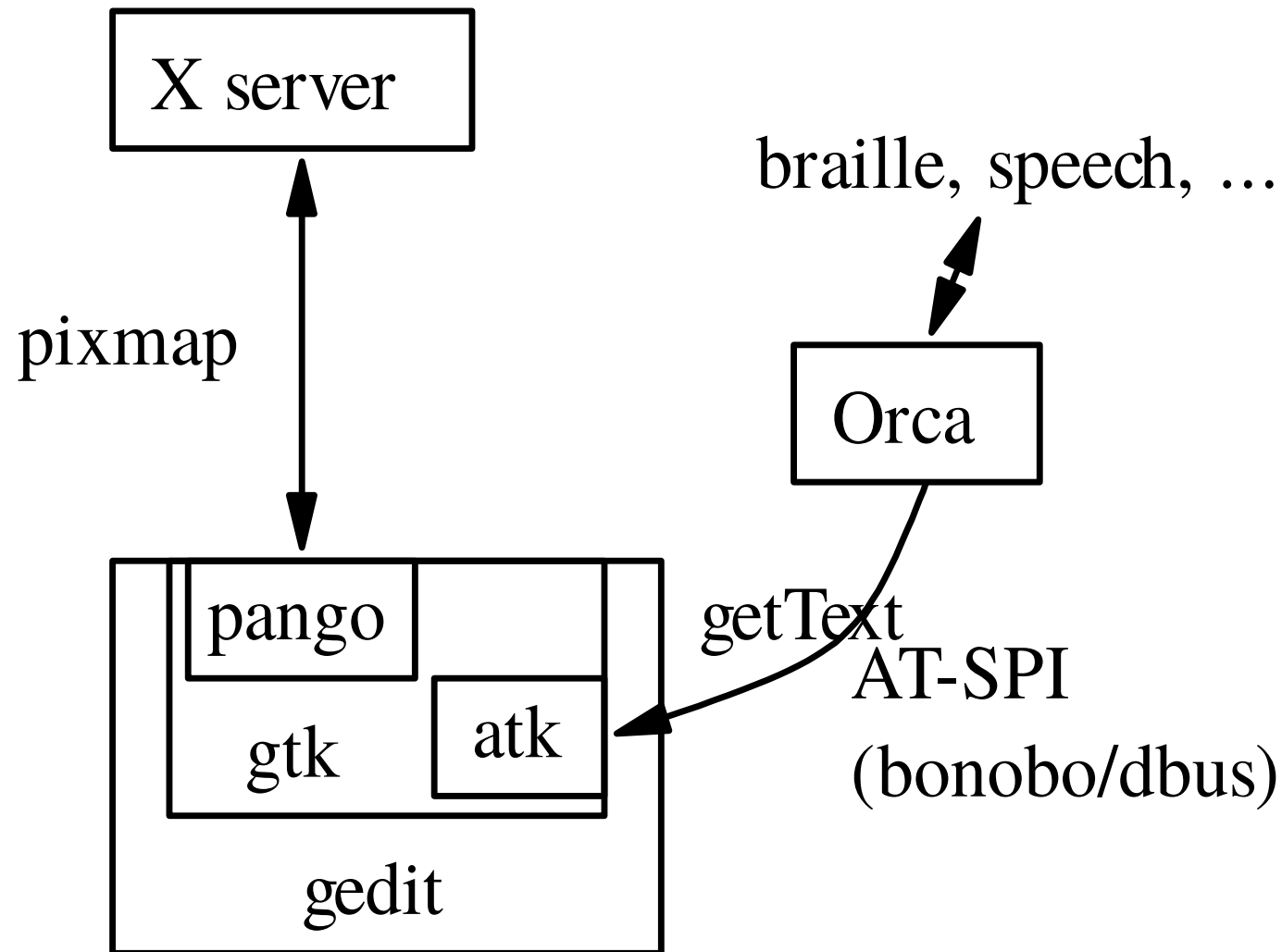
Generic methodology



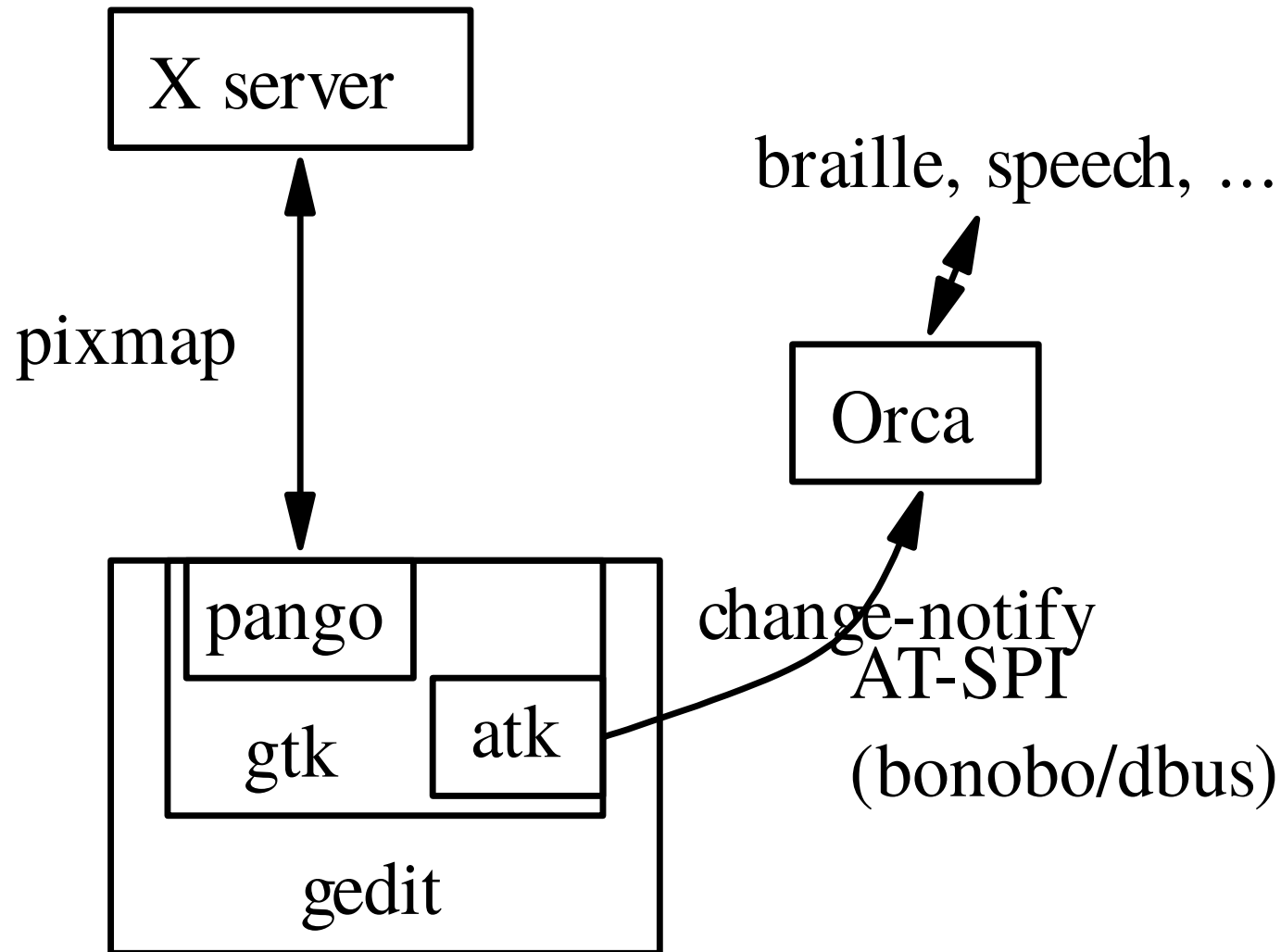
X accessibility, AT-SPI RPCs



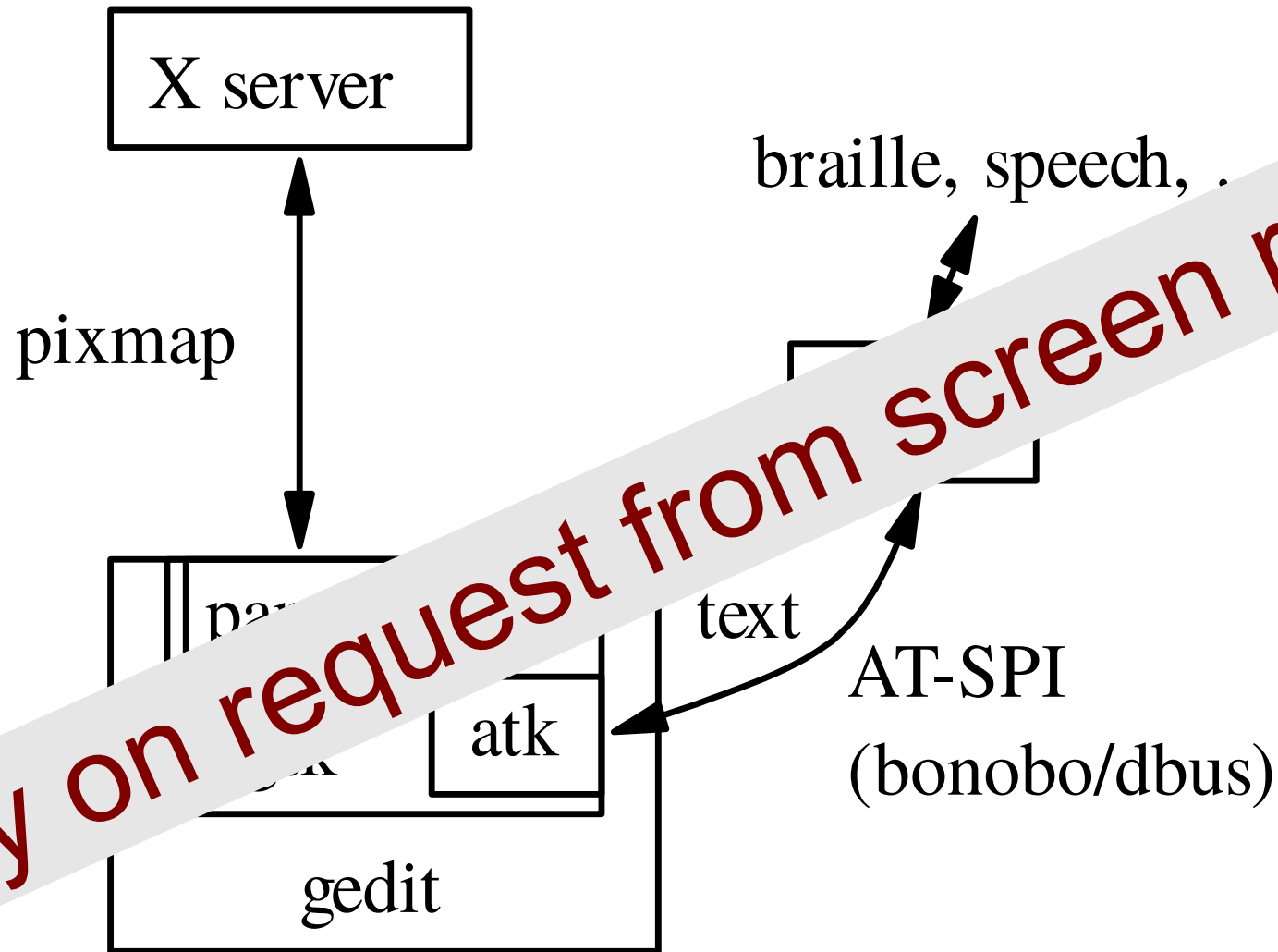
X accessibility, AT-SPI RPCs



X accessibility, AT-SPI RPCs



X accessibility, AT-SPI RPCs



Only on request from screen reader



Abstract representation

- Window
 - Vertical container
 - Menu bar
 - File Menu
 - Open Menu Item
 - ...
 - ...
 - Horizontal container
 - Text area
 - Ok button



Technically speaking

A lot of applications already *technically* accessible

- Console
- GTK2/3
- KDE-Qt4 sketchy, Qt5 improving
- Mono?
- Acrobat Reader

A lot are not

- KDE-Qt3
- Xt
- Self-drawn (e.g. xpdf)



Debian packages

- brltty: braille drivers
- speech-dispatcher: speech drivers
- at-spi2-core: generic server parts of RPCs
- libgail*, libatk*: gtk-ish server parts of RPCs
- qt-at-spi: qt4 server part of RPCs
- Integrated in qt5 core
- gnome-orca: screen reader



So, what do we want to achieve?



So, what do we want?

At least, accessibility stack working in all desktops

- A matter of a few tests, see coming slides
 - Include them in regular regression tests
- Allows to access applications
- I.e. allows “foreign user” use-case
 - E.g. work with the regular user of the desktop
 - May not be convenient, but far better than nothing!!

Be completely accessible

- More involved, see coming slides



Accessibility stack working

Goal: user just has to start orca to get speech

- Means the accessibility stack should be ready
- ATM, not enabled by default with gtk2, qt4 and qt5 applications
 - `export GTK_MODULES=gail:atk-bridge`
 - `export QT_ACCESSIBILITY=1`
 - `export QT_LINUX_ACCESSIBILITY_ALWAYS_ON=1`
- BTW, time to change that by default?
 - Bugs? Need to get fixed anyway!



Testing accessibility stack

In **both** dm then “joe” user GUI session

- At-spi-bus-launcher and at-spi2-registryd running as proper user (dm then joe)
 - /etc/xdg/autostart/at-spi-dbus-bus.desktop
- session dbus gives user's AT-SPI bus address:

```
dbus-send --session --dest=org.a11y.Bus --print-reply /org/a11y/bus org.a11y.Bus.GetAddress
```

- and `xprop -root AT_SPI_BUS` returns it
- and toolkits enable their accessibility layer



Testing accessibility stack

See <http://wiki.d.o/accessibility-maint>

- `git clone git://git.debian.org/pkg-a11y/check-a11y`
- `source env.sh`
- `make check`
 - Checks gtk2, gtk3, qt4, qt5
- `./troubleshoot`
- `orca -l` sees accessible applications
 - e.g. geany, gedit, ...

How will the user start Orca?

“foreign user” use-case

- Can just ask the regular user to start Orca
- But shortcut very welcome!
 - E.g. using a computer at a public library
- Gnome settled on super-alt-s
 - How to decide a universal shortcut? See with freedesktop?
- Autostart on plugging USB braille display?

How will the user start Orca?

“regular user” use-case

- Automatic start, easy to enable
 - Icon somewhere in the interface
 - Must be accessible!!
 - Command-line interface for Debian Installer

```
gconftool-2 --type bool --set  
/desktop/gnome/applications/at/screen_reader_enabled true
```

```
gsettings set org.gnome.desktop.a11y.applications screen-reader-  
enabled true
```

```
xfconf-query -c xfce4-session -p StartAssistiveTechnologies
```

```
qdbus org.kde.kaccessibleapp /Adaptor setSpeechEnabled true
```

- Add yours?



Completely accessible

Desktop environment bits needs to be accessible

- Start menu, panel, task switching, ...
- Gtk/Qt: relatively easy for at least basic support
 - Check out orca/accerciser
 - Everything achievable with keyboard
- Self-drawn: has to interface with AT-SPI (through ATK or natively)
- ATM, only gnome and mate are really accessible enough, and xfce and lxde OKish.
 - Having more choice always better!



Graphical applications

- Design your application **without** gui in mind first
 - Logical order, just like CSS 😊
- Use standard widgets
 - e.g. *labeled* text fields
 - Avoid homemade widgets, or else implement atspi yourself for them
 - Always provide alternative textual content for visual content
- Keep it simple!
 - Not only to make screen reading easier, but to make life easier for all users too!



Test it yourself! (GUIs)

`orca -e braille-monitor`



- Then work as usual
- Only using keyboard
- Checking text appears there

And crash-test

- Turn on speech, switch off the screen

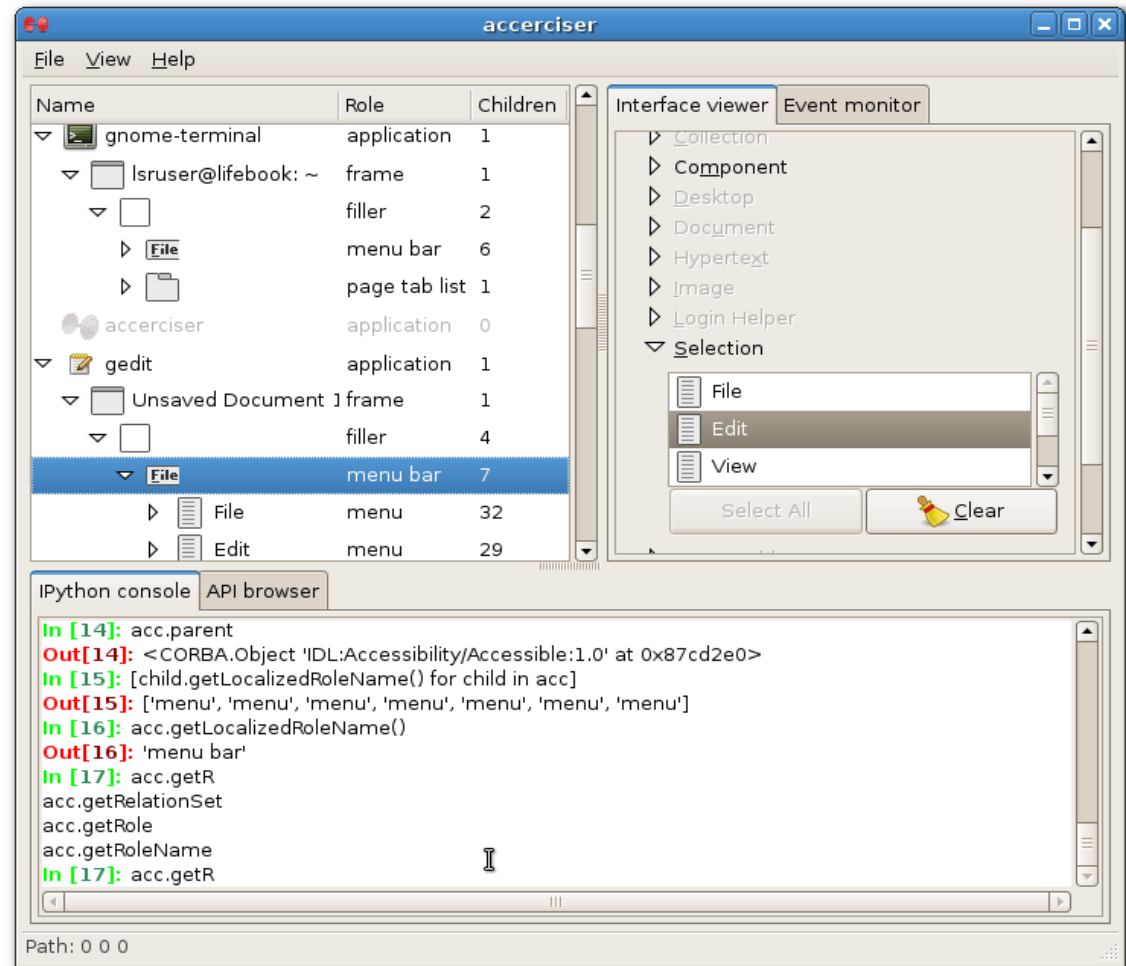
<https://developer.gnome.org/accessibility-devel-guide/stable/>⁹²



Test it yourself! (GUIs)

Accerciser

- Sort of debugger
- Tree of widgets
- Properties





About bugs

- Take users suggestions into consideration
 - E.g. bracketed links in text web browsers
 - Be patient with disabled people
 - It's not easy for them to use your software
 - It's even more difficult for them to explain their problems in an understandable way
 - e.g. “braille doesn't follow”
- ➔ Discuss!



About bugs (2)

- Try to keep in mind their disability and their consequences
 - Yes, blind users don't care that the framebuffer doesn't show up properly!
- You could even contact your local institutes for disabled people, to discuss directly with users



Conclusion

- Quite a few of your desktop users need accessibility
- In any situation
 - Library, practice rooms, etc.
- Please help us making accessibility **mainstream!**
- debian-accessibility@lists.debian.org
- <http://wiki.debian.org/accessibility-maint>