



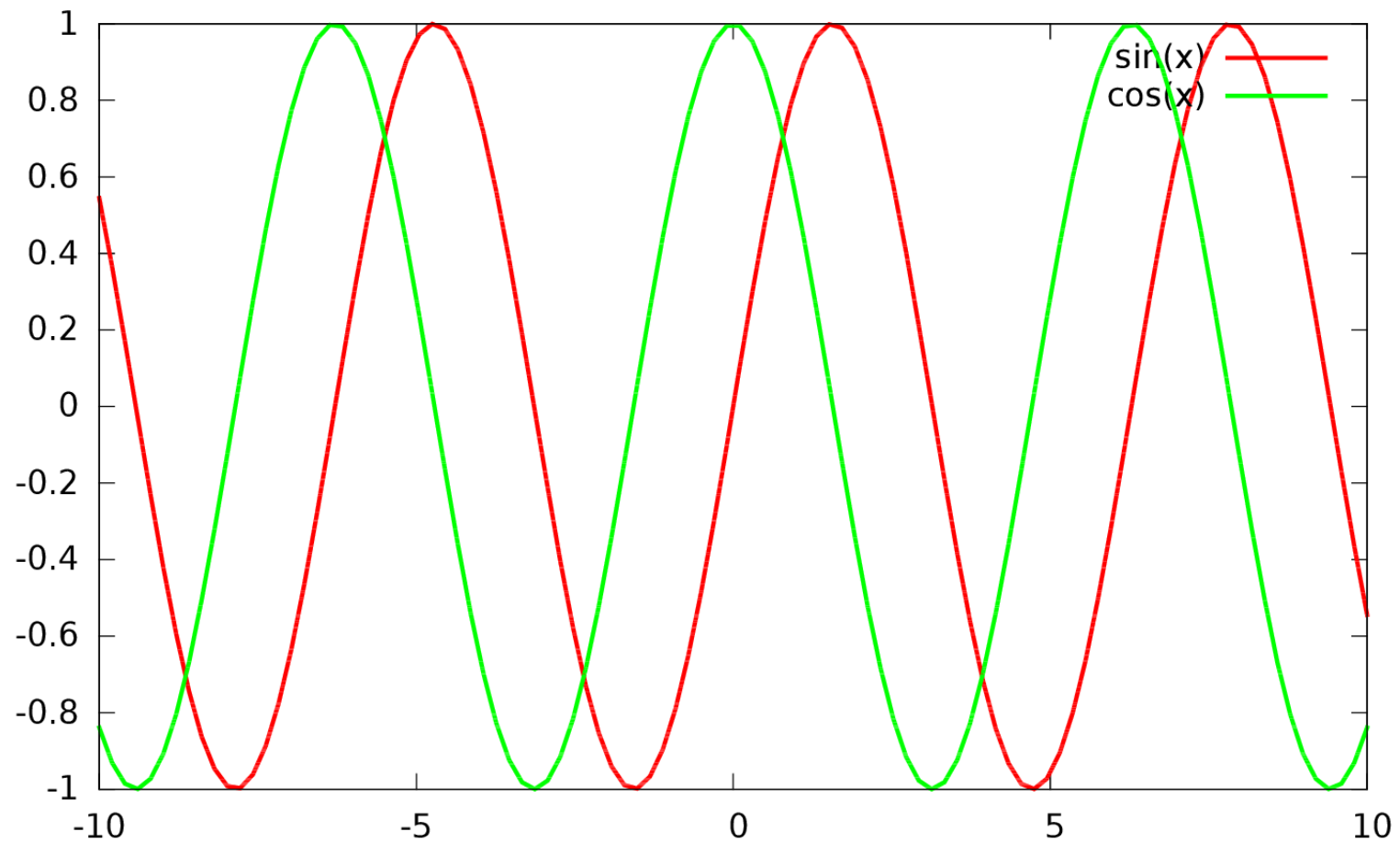
# Making Debian for everybody

Samuel Thibault  
Slides & stuff on  
<http://brl.thefreecat.org/>

<http://liberte0.org/>



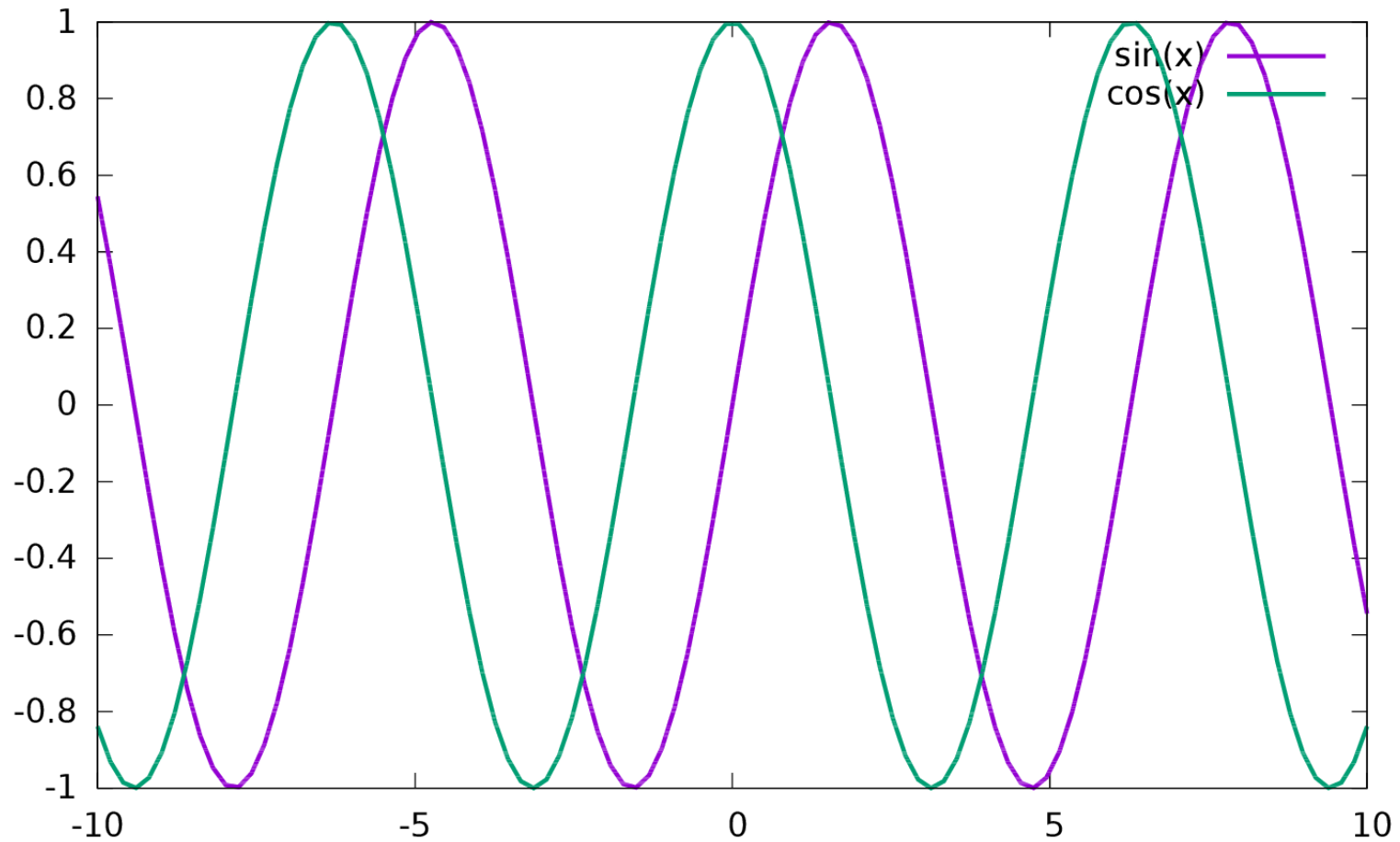
# Gnuplot



Color blindness: 8% male, 0.5% female



# Gnuplot 5!!



Color blindness: 8% male, 0.5% female



# What is accessibility?

AKA a11y

Usable by everybody, including 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;



# Hardware



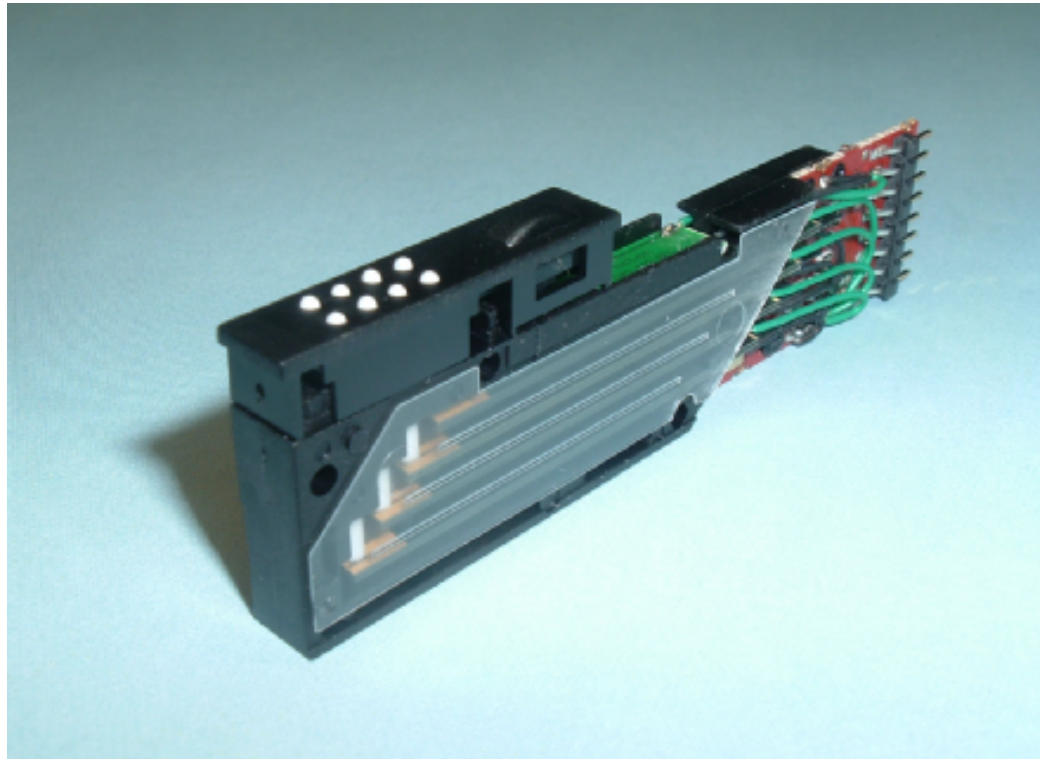
- Braille input/output
- Speech synthesis
- Joysticks
  - Basically replace mouse
- Press button
  - On-screen virtual keyboard
- Eye-tracking
- ...







# Piezo braille cell



- Usually 8 dots  $\approx$  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



# 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 <sup>21</sup>



# 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, medecine, 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

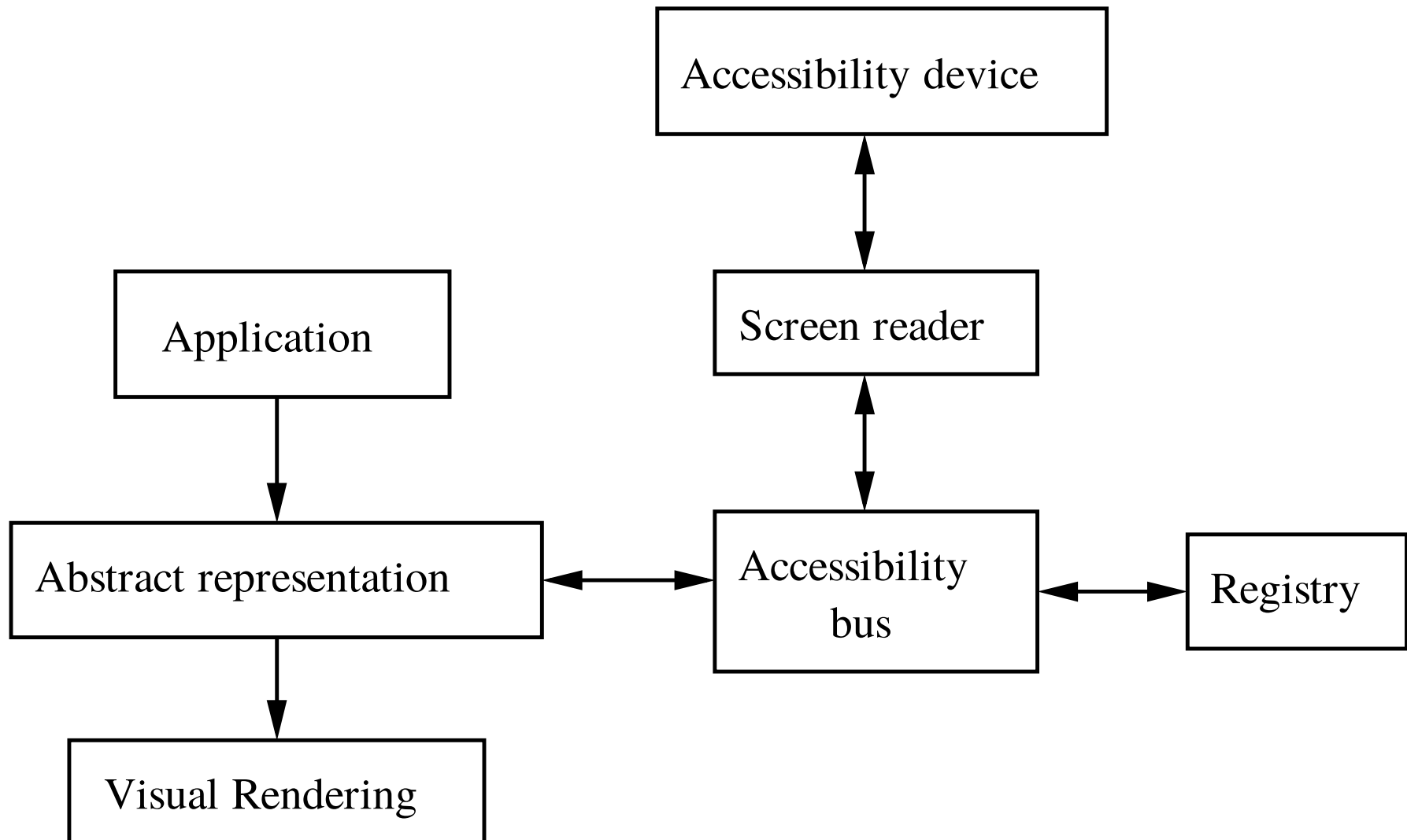


# Status in a few words

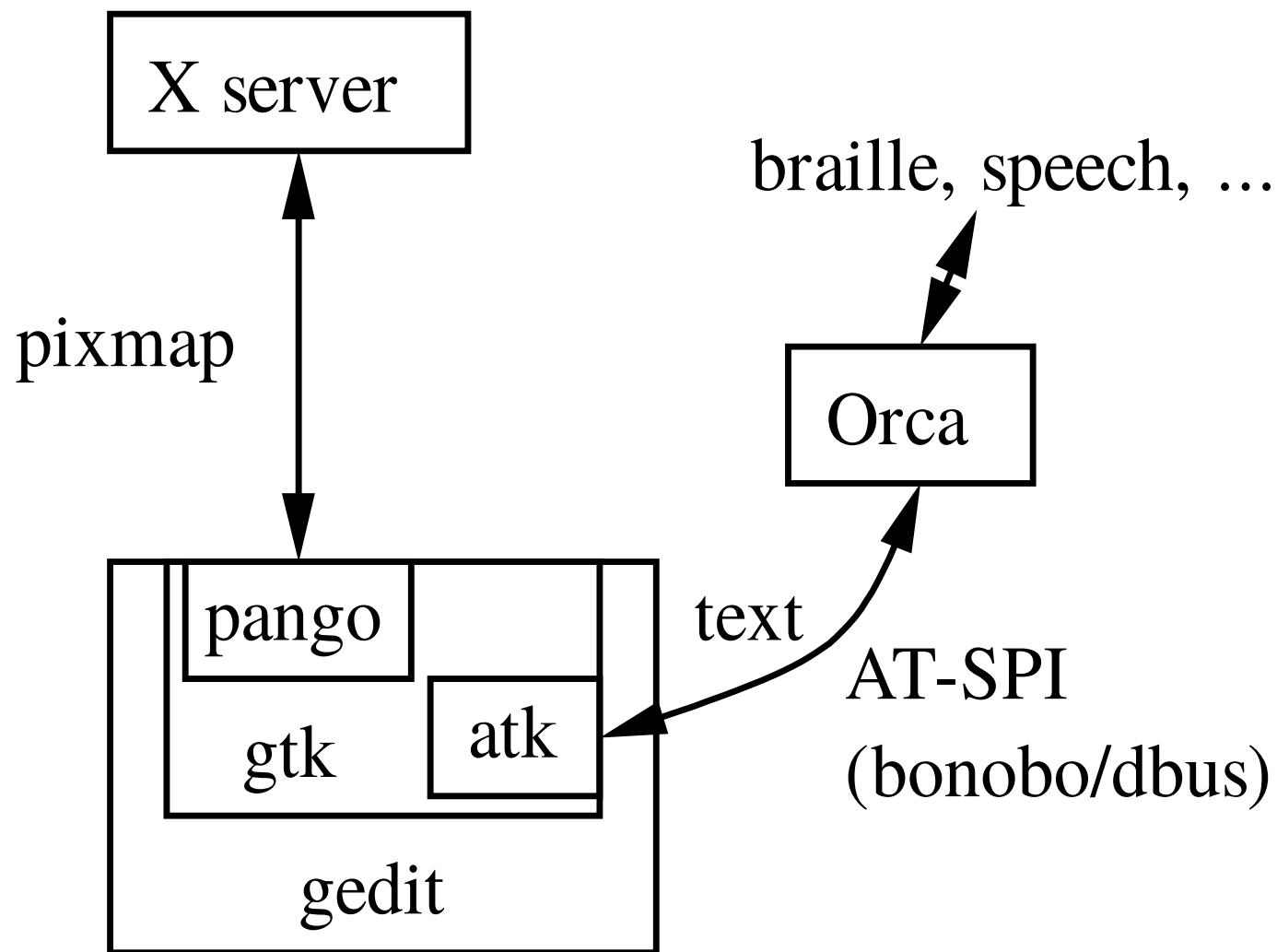
- Text mode is generally quite well accessible
  - But not so well suited to beginners
- Gnome applications quite accessible
  - Gnome 3 was however almost a restart-from-scratch
- We're late compared to the Windows world
  - We started less than a dozen years ago
  - They started a couple of decades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



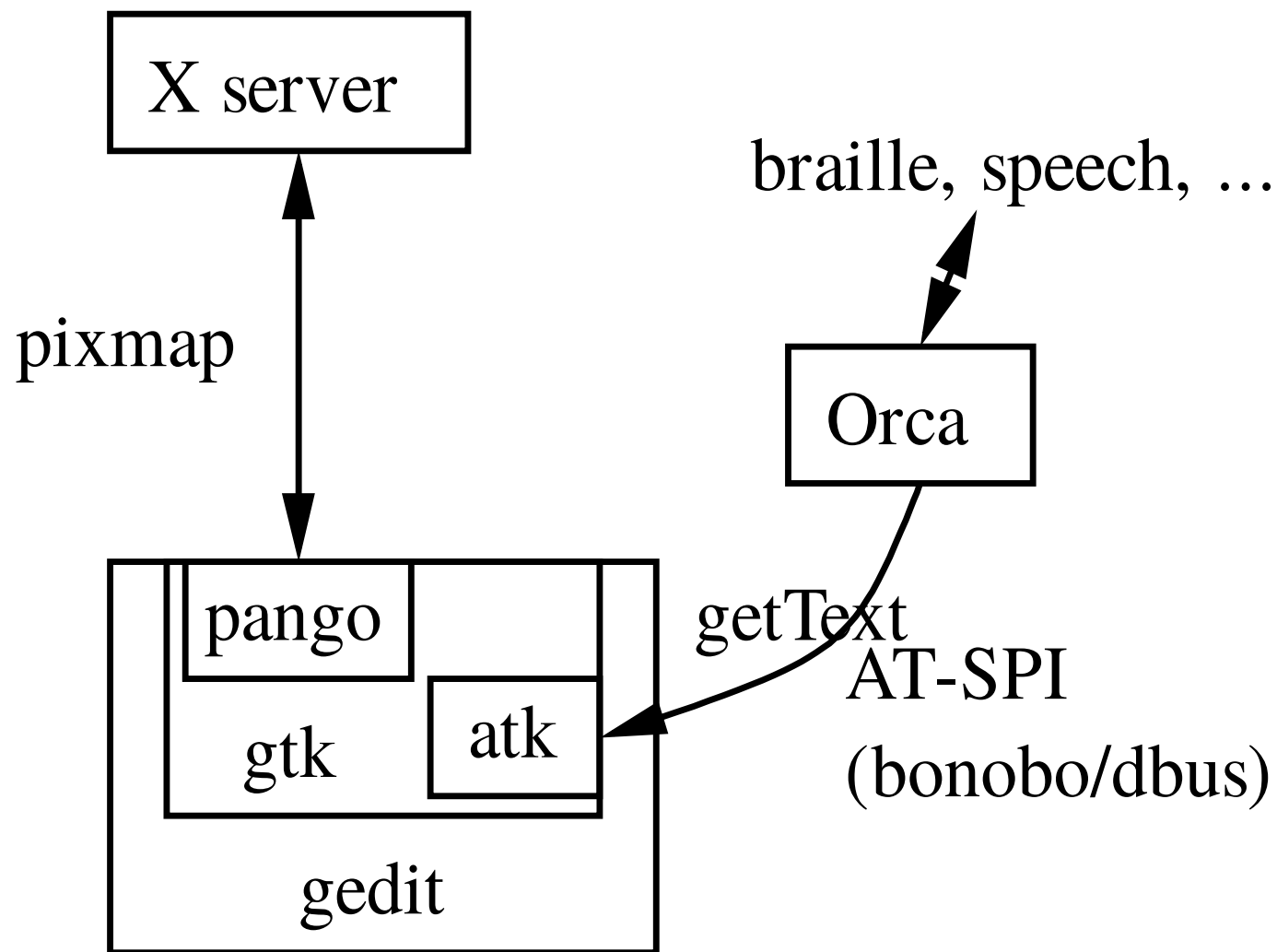
# Generic methodology



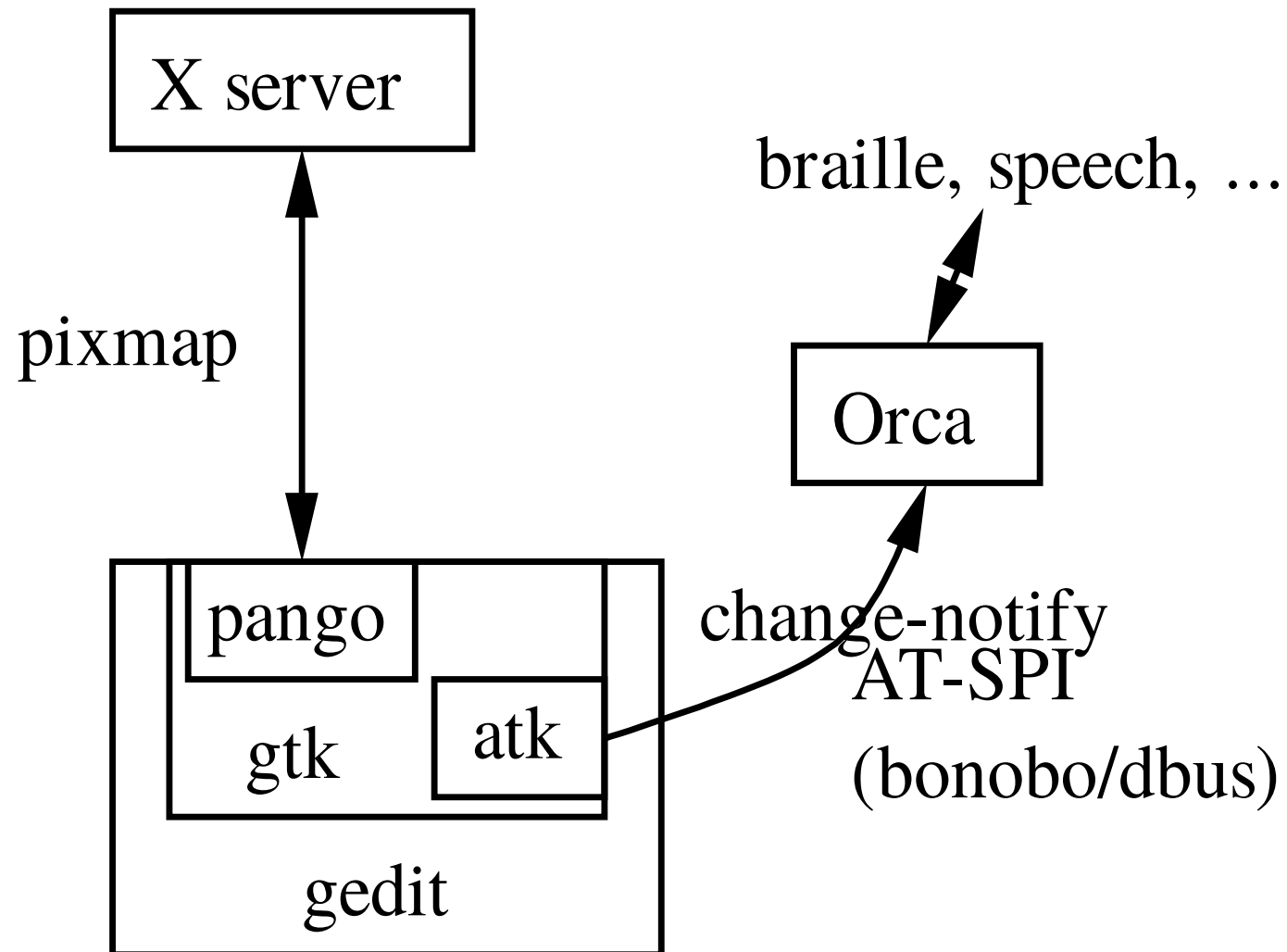
# X accessibility, AT-SPI RPCs



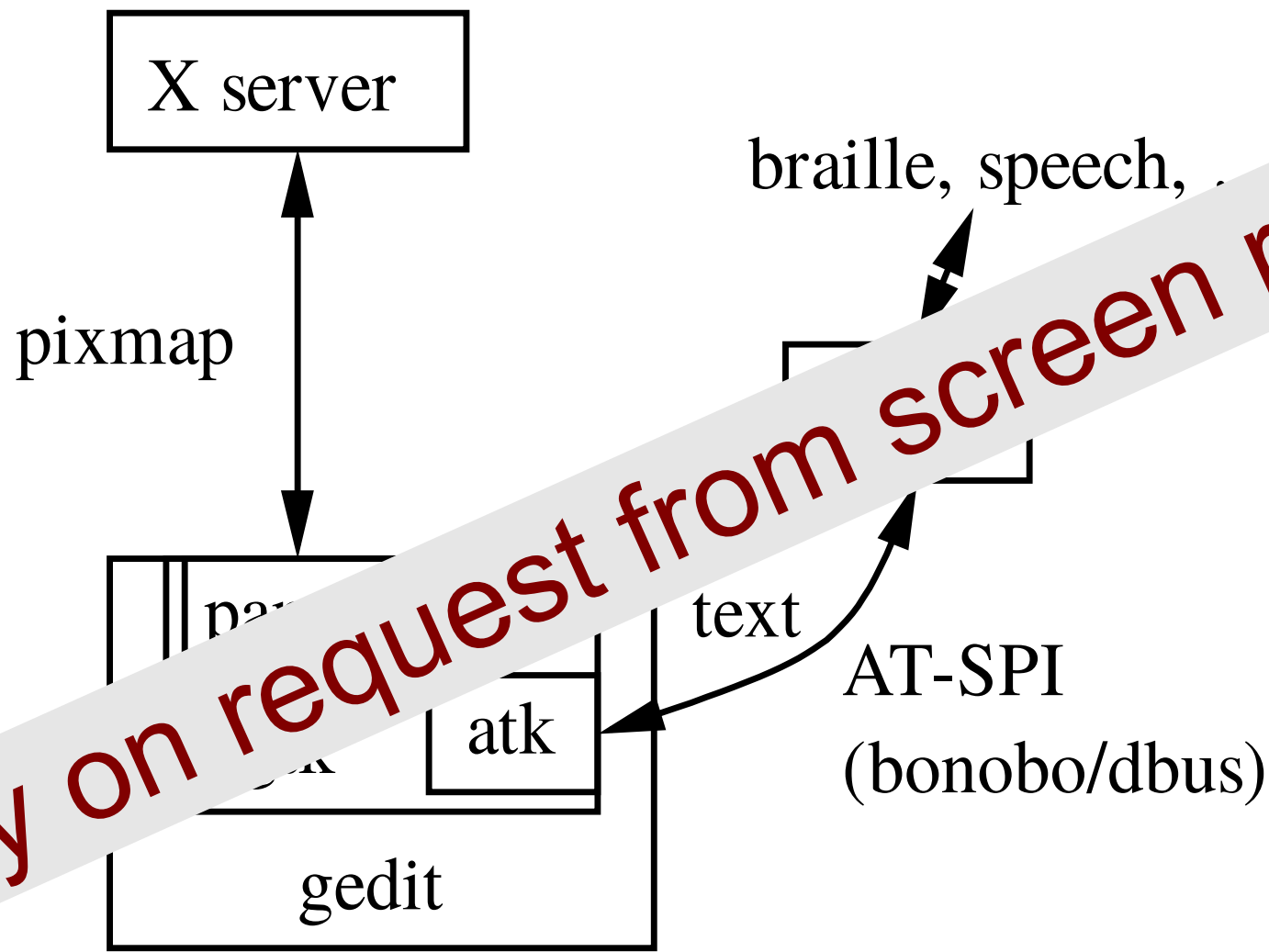
# X accessibility, AT-SPI RPCs



# X accessibility, AT-SPI RPCs



# X accessibility, AT-SPI RPCs



**Only on request from screen reader**



# 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 atk 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!



# The Debian Accessibility team

# The Debian Accessibility team

## Resources

- [#debian-a11y](#)
- [debian-accessibility@lists.debian.org](mailto:debian-accessibility@lists.debian.org)
- [pkg-a11y-devel@lists.alioth.debian.org](mailto:pkg-a11y-devel@lists.alioth.debian.org)
- <https://www.debian.org/devel/debian-accessibility>
- <https://wiki.debian.org/accessibility>
- <https://wiki.debian.org/accessibility-devel>
- <https://wiki.debian.org/accessibility-maint>



# The Debian Accessibility team

## Packaging

- Hardware drivers (brltty, speakup)
- Software drivers
  - speech synthesis / recognition
  - Braille in/out (liblouis, brailleutils, natbraille, ...)
  - zoom, color management, keyboard, ...
- Screen reading stack (\*at-spi\*, orca)
- Only little dedicated software (daisy/ebook)
- Some TODO left, backports

# The Debian Accessibility team

## Discussing with other Debian teams

- Installer
- LiveCD
- Toolkits
- Desktops
- Documentation
- ...

# The Debian Accessibility team

## Discussing with debian-boot (Debian Installer d-i)

- Supporting accessibility within d-i
  - Braille, speech, high contrast
  - TODO: graphical installer accessibility
- Bootstrap questions
  - Automatically enabling it (USB)
  - Beep at boot prompt
    - Know when to press enter...
    - Shortcut to enable speech
- Default desktop choice

# The Debian Accessibility team

## Discussing with LiveCD

- TODO: tune support
- TODO: bootstrap support

# The Debian Accessibility team

## Discussing with toolkits

- Making sure toolkits are accessible via AT-SPI
  - Environment variables to enable it by default
    - [GTK2/3](#), [QT4/5](#), [Java in debian 9](#) \o/
  - Missing support?
    - [TK](#)
    - [Gnustep](#)
    - [SDL](#)
    - [Xaw](#), [athena](#), [fltk](#), [motif](#)

## Discussing with desktops

- Making sure AT-SPI stack works
  - Dbus session
  - at-spi daemons startup
  - Normally handled by
    - `/etc/xdg/autostart/at-spi-dbus-bus.desktop`
  - Please respect xdg so that can work :)
- Give a way to start Orca screen reader
  - super-alt-s in Gnome



# 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, ...

# The Debian Accessibility team

## Discussing with desktops

- Display Managers (gdm, lightdm, ...)
  - Again, way to start screen reader etc.
- Ongoing work: automatic desktop testing
  - <https://familiekainz.at/a11y>
  - TODO: could include this to QA page?



# The Debian Accessibility team

- Accessible boot?
- Debbugs: a11y tag added recently
- Release: a11y bugs considered RC?
- Debtags:
  - TODO: accessible-with:: tags to packages
- Documentation:
  - TODO: Dev. Ref., New Maintainer's guide
  - TODO: Bits in Debian Policy?
  - TODO: derivatives
  - TODO: accessible events (debconf, etc.)

# The Debian Accessibility team

## Current big issue

- Screen reader sound support in console
  - Pulseaudio thinks root shouldn't do sound
    - Should be in user session
  - But screen reader is global, not per-user
    - Otherwise can't log in...
  - Concurrency on sound boards
  - We need help here

# The Debian Accessibility team

## Getting people involved, problems

- “I don’t know how that is supposed to work”
  - I didn’t know either when I started :)
- “I don’t know the needs”
  - Yes, it’s a long learning. Discuss on lists
- “I don’t have the hardware to test”
  - No problem, there is virtual hardware
- “I don’t know how to test”
  - TODO: document how to test



# Conclusion

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