

How to make a distribution accessible, right from its installation

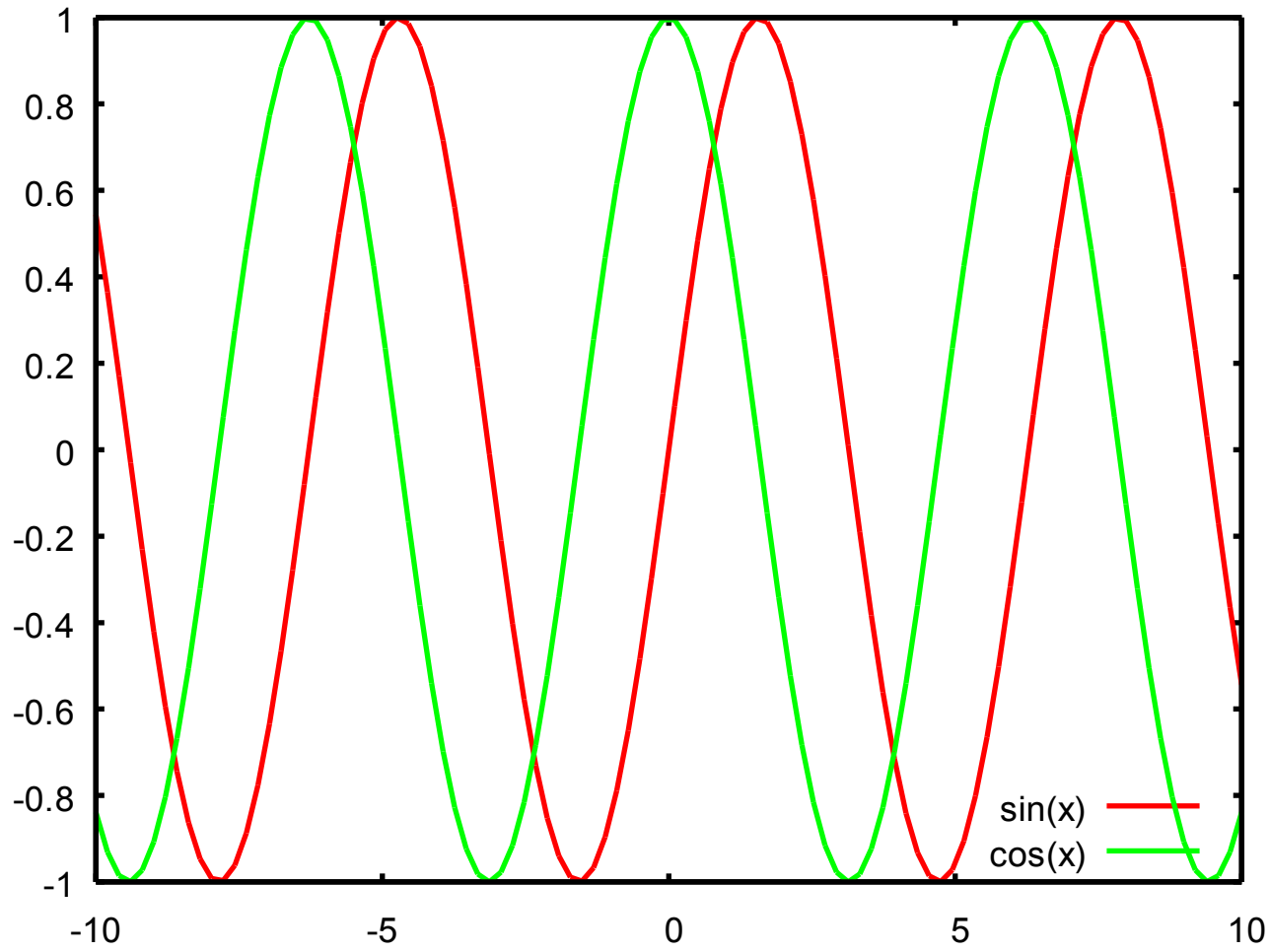
some feedback from Debian

Samuel Thibault
<http://brl.thefreecat.org/>
<http://liberte0.org/>



Outline

- Introduction to accessibility
- Hardware
- Software interfaces
- Discussion
- Guidelines



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



Hardware

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



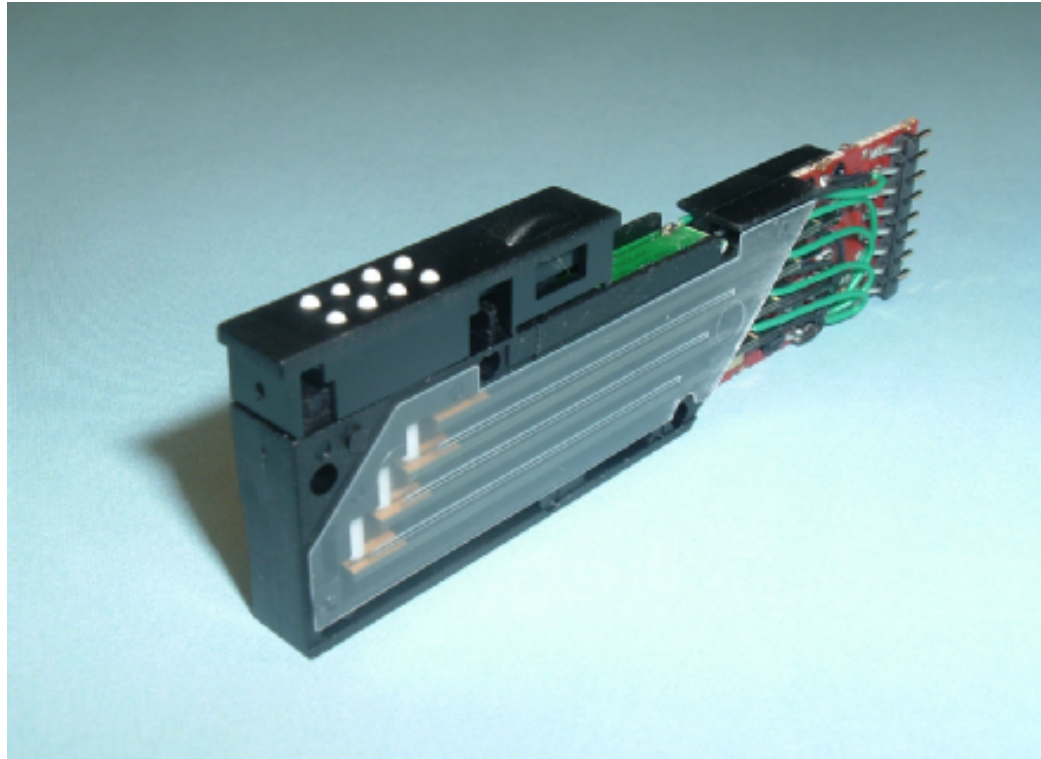
Don't focus on one technology

Even for a given disability

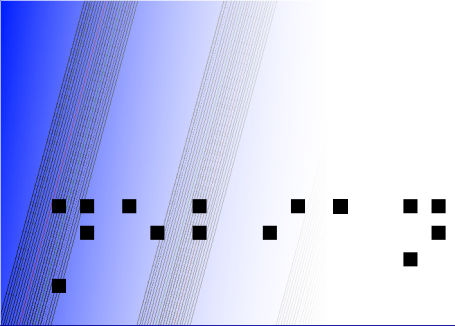
- Braille is not perfect
 - A lot of blind people can't read braille
 - Braille devices are very expensive (several k€)
- Speech synthesis is not perfect
 - Noisy environments
 - Tedious for spelling issues



Piezo braille cell



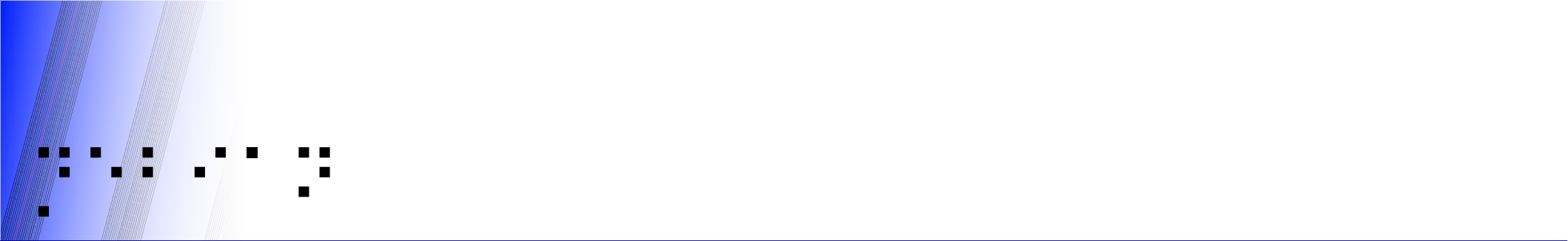
- Usually 8 dots \sim = one character
- Piezoelectric effect to move up/down



Braille devices



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



Software interfaces



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

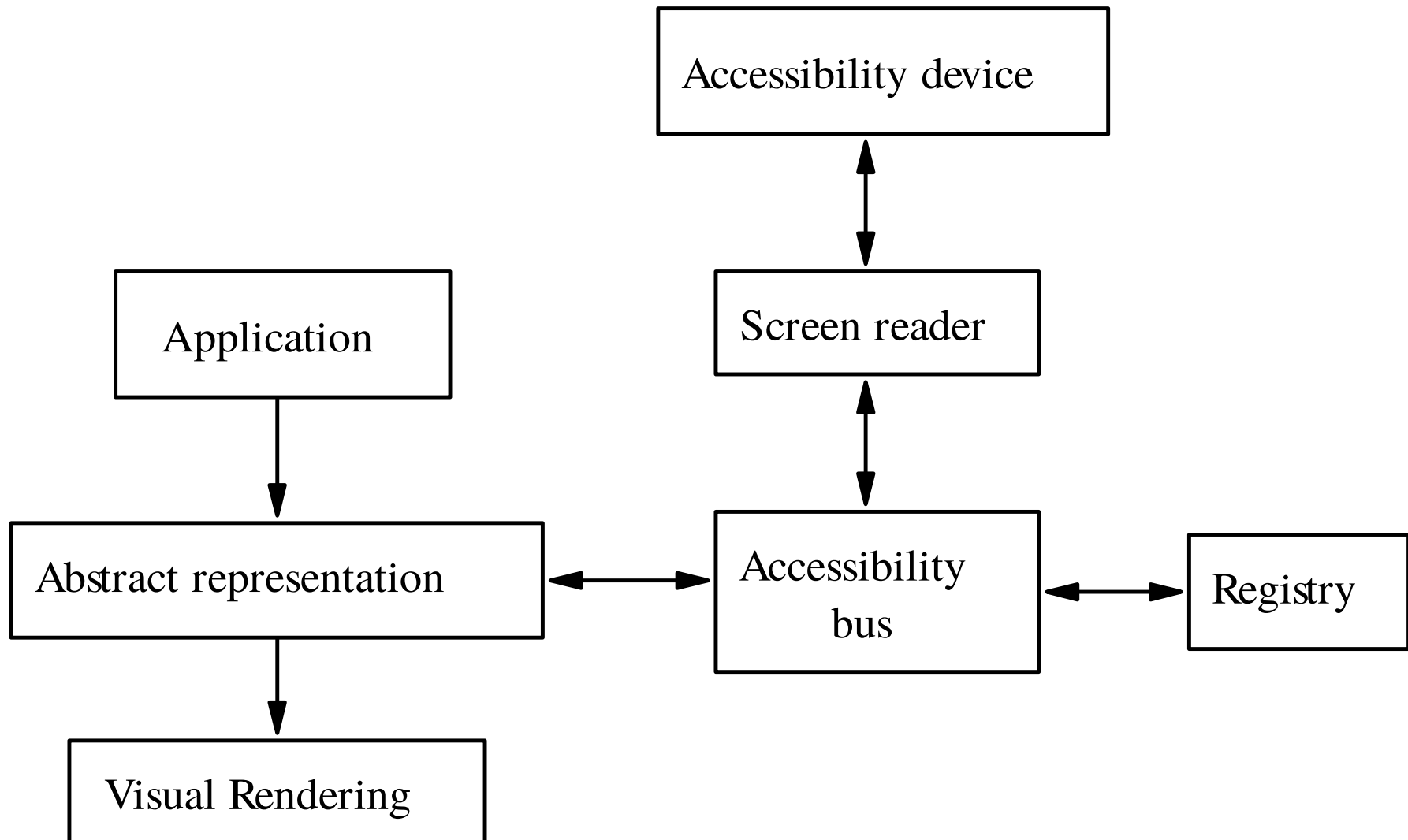
➔ Better make **existing** applications accessible ¹³



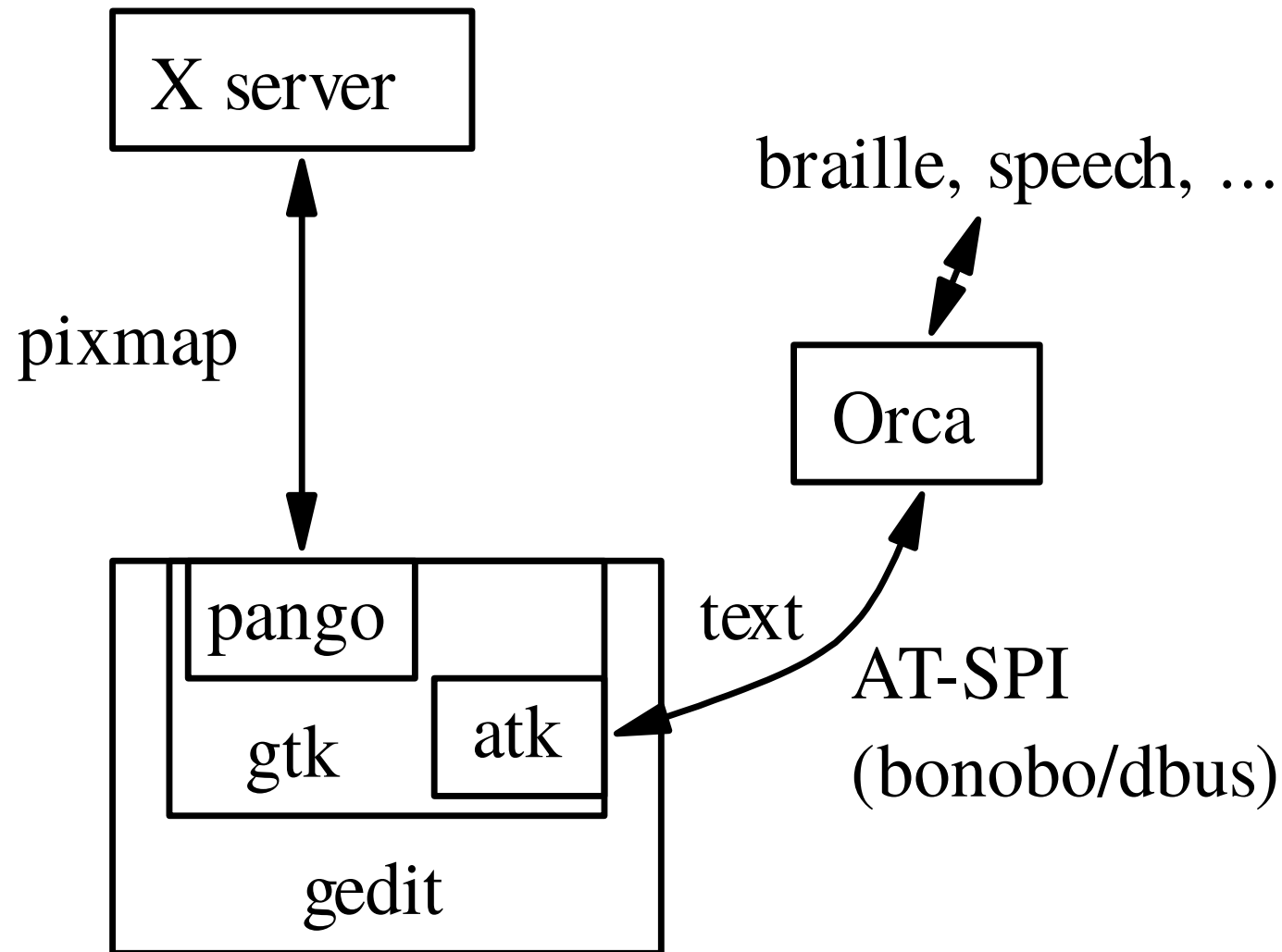
Status in a few words

- 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



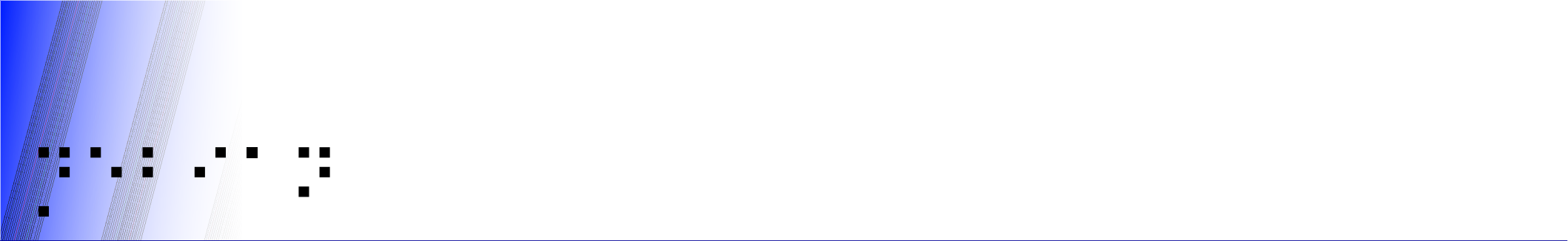
X accessibility, AT-SPI





Technically speaking

- A lot of applications are already technically accessible
 - Console
 - GTK
 - KDE-Qt4/5 (“Real Soon Now”)
 - Acrobat Reader
- A lot are not
 - KDE-Qt3
 - Xt
 - Self-drawn (e.g. xpdf)



Discussion



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.



Why is accessibility so hard?

- Vint Cerf asked in Communications of the ACM November 2012:
“Why is accessibility so hard?”
- Issues are mostly *not* technical, actually



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
 - Almost nobody with awareness and programming skills either
 - “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



The specialized distribution trap

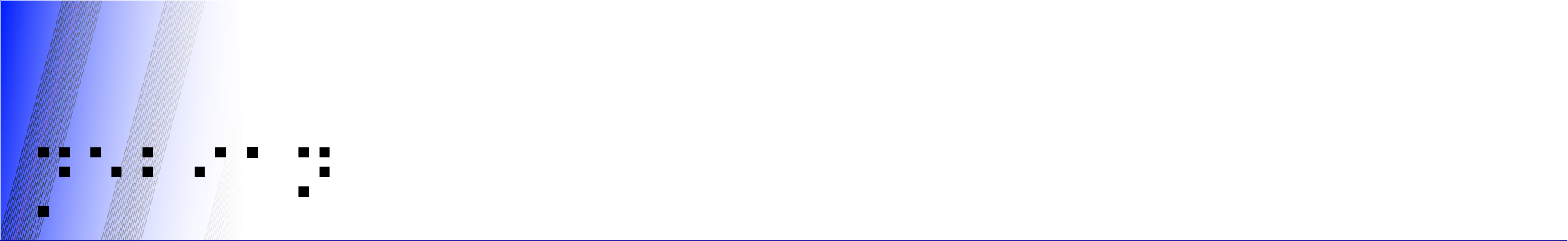
There shouldn't be specialized distributions

- Accessibility is orthogonal to any other concern
 - It's orthogonal to blends and tasks
 - Users should be able to choose blend&task
- All specialized 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



So, what to do?



Software Distribution

Text-based distribution

Installation, configuration, ...

A plethora of software, often text equivalents

Mpg321, mc, o3tohtml...

Please continue packaging those!

Accessibility-related packages

Brltty, AT-SPI, Orca, ...



How to bootstrap?

Entering a cyber café, how to access computers?

- Autodetection
 - USB braille devices
- Shortcuts
 - Existing: XAccess (standard shortcut), Compiz zoom.
 - Speech synthesis?
- Accessibility panel
 - Needs to be accessible itself!
- A USB key with a config file?



How to bootstrap? (2)

Brand new computer, let's install Linux!

- Same issues and potential solutions
- Nowadays: usually “accessible” installation CDs
 - e.g. start speech synthesis by default
- But **all** installation CDs should be accessible!
 - Including e.g. all Debian forks for various uses
- Debian installer
 - USB braille auto-detection
 - High contrast or hardware speech by hand
 - Software speech synthesis (s <enter>)



Installer TODO

Details available on <http://brl.thefreecat.org/>

- Switch to text mode
 - and run brltty (udev script) or speakup
- Graphical accessibility
 - AT-SPI & Orca
- Color themes
- Enable same accessibility features at reboot!
- Being able to pass parameters for tuning them
 - Kernel cmdline or preseed



Has to be testable

By all maintainers

- Debian installer: wiki page documents testing
- Part of the regression tests
- No need for specific hardware
 - Qemu has virtual braille device



What about the bootloader?

Mostly not accessible nowadays, but improving

- Beep to tell that the menu is shown (done)
- Keyboard shortcuts (done)
- Beep to tell which item is selected
- Pre-synthesized ogg files saying entries
 - Sound drivers in the bootloader!?
- Screen reader
 - For the core, just another alternative terminal



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



More general ideas

Getting people involved

Subscribe to foo-accessibility

Make sure yourdistrib.org is accessible

Add an “accessibility” chapter to the installation manual

Add an “accessibility” chapter the Maintainers' guide

Add an “accessibility” tag to bugs

Cc-ed to foo-accessibility

Foo-accessibility mailing list

- Good to centralize user knowledge
- Shouldn't become a “side-park”
 - Discussions should happen on main lists
 - Cc foo-accessibility

Discussing is essential

- Find compromises
- Involve other maintainers
- Sustainability



Conclusion

- Quite a few of your distribution users need accessibility
- Right from the start
 - Yes, blind people do reinstall their PC at 2am
 - No, they don't necessarily have a sighted sibling near them at 2am :)
- In any situation
 - Library, practice rooms, etc.
- Please help us making accessibility **mainstream!**