Open source accessibility tools

It's easy to modify your desktop or add assistive technologies with Linux. Here are some of the tools available.

LINUX IS an ideal choice for those that need flexibility over their computer's desktop environment. This is because any user who has a disability, a particular condition or just a certain way of working is free to request an addition from the developers, many of whom are already coding hard to make Linux easier to use for people with special requirements. And with the necessary skills, it isn't too difficult to make a contribution yourself. You only have to open the *Firefox* browser and press Ctrl and + or Ctrl and − for changing the text size to see that accessibility is never far from the thoughts of developers.

Unlike other operating systems, where you typically only get a limited set of configuration options, Linux usually errs on the side of complexity. In Microsoft Windows, for example, try to change the size of system and application fonts with just a couple of clicks, and you'll see what we mean. It's impossible. Linux offers more choice, and this can cause confusion if you're a new user, but the advantage is that when you're a little more comfortable with the Linux desktop, the degree of control is unprecedented.

For example, you have complete control over the size and type of fonts used throughout the desktop by selecting Fonts from the System > Preferences menu. And the same is true of the colour scheme. This can be changed from the Theme entry in the same menu. The Theme window lets you choose
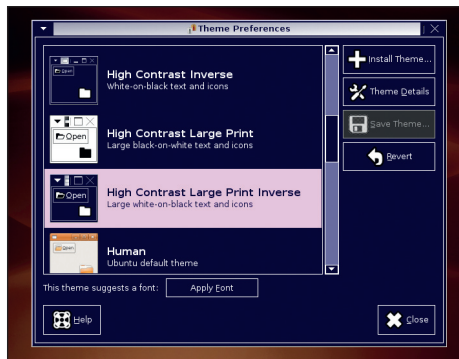
from around 20 pre-installed themes (and there are more available online), including high contrast and large font selections designed for people that have difficulty reading the display.

ON YOUR COMMAND

After colours and fonts have been changed, your Linux desktop can be tailored further to accommodate three broad categories of accessibility. The first is for users with a partial visual impairment. You need large, easy to read characters, with the minimum amount of detail.

The second category is for more severe visual impairment, and includes total blindness. This is perhaps an area that isn't as well trodden as the others, as the technologies involved are quite advanced. Text-to-speech, which is the main solution, is at an 'in development' stage for Linux desktops, but that doesn't mean that it isn't usable.

The final impairment to accessibility is a physical disability. This is one area where Linux shines, because everything is so configurable. It might not offer a simple one-click solution, but if you're willing to spend some time configuring your system, we're sure you'll find a combination that works for you.

The place to start is the Assistive Technology Preferences window, which you can open by selecting Assistive Technology Support from the System > Preferences menu. It's from here that you can enable three desktop enhancements that help with the three broad categories of accessibility we just mentioned. These are a screenreader, which attempts to read the contents of the screen using a speech synthesizer; a magnifier for making small screen details easier to read; and an on-screen keyboard, which opens up dozens of alternative input methods.
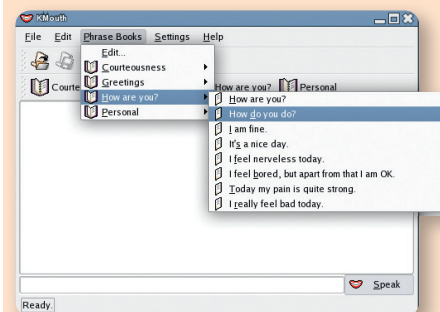
Just click on the options you need, making sure the Enable Assistive Technologies checkbox is ticked, followed by clicking on the Close And Logout button. For these changes to take effect it's necessary to log out of your system and back in again − you don't need to go so far as rebooting your machine, though.

The first thing you should notice when your desktop reappears is that there is an application

A high contrast desktop is only a click away using the Theme setting in Ubuntu.

called *Gnopernicus* running. Keeping to the ancient Linux tradition of silly names for things, *Gnopernicus* is actually at the centre of your desktop's accessibility configuration.

USING GNOPERNICUS

The clever thing about *Gnopernicus* is that it's responsible for tracking application focus. Application focus is where a certain function within your application is highlighted − it could be the OK button after changing a value, or Save after entering a filename. Normally, you can manually change focus by pressing the Tab key, but wherever the focus falls, the magnifier and Braille readers will follow. That's because *Gnopernicus* forwards the application focus information to the magnifier tool,

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which you should see on the right-hand side of the screen if you've turned it on. It can also pass this focus information on to a Braille output module – included with Ubuntu. For Braille support, you need to make sure you've got a working USB Braille reader. Many popular readers will work just fine, including models from Braillex, Baum, Handalog and Telesensory, but you will have the best luck with a device that uses USB. You can configure your reader from *Gnopernicus* by clicking on the Preferences button, followed by Braille.

Start with setting up the Braille device to work with Linux and customising it if needed from the first on-screen button, and then enable the on-screen Braille monitor by selecting it from the Startup Mode button at the top of the main *Gnopernicus* window. You can also activate and remove the other modules from here, such as the magnifier, without having to log out and back in again.

AN ON-SCREEN DESKTOP

Last but by no means least in Ubuntu's armoury of accessibility is *Gok* – the Gnome Onscreen Keyboard. With *Gok*, you can control the computer without having to use a standard mouse or keyboard – perhaps by using a pointing device instead. You'll need to run *Gok* manually by pressing Alt+F2, followed by typing **gok** into the requester and pressing Run. The software doesn't look particular pretty, but it's capable of grabbing every mouse action from an application and creating a simple interface on the fly.

To see it at work, open *Firefox* followed by *Gok*. Use the UI Grab in *Gok* to take control of *Firefox*, and *Gok*'s colourful box interface will switch to represent
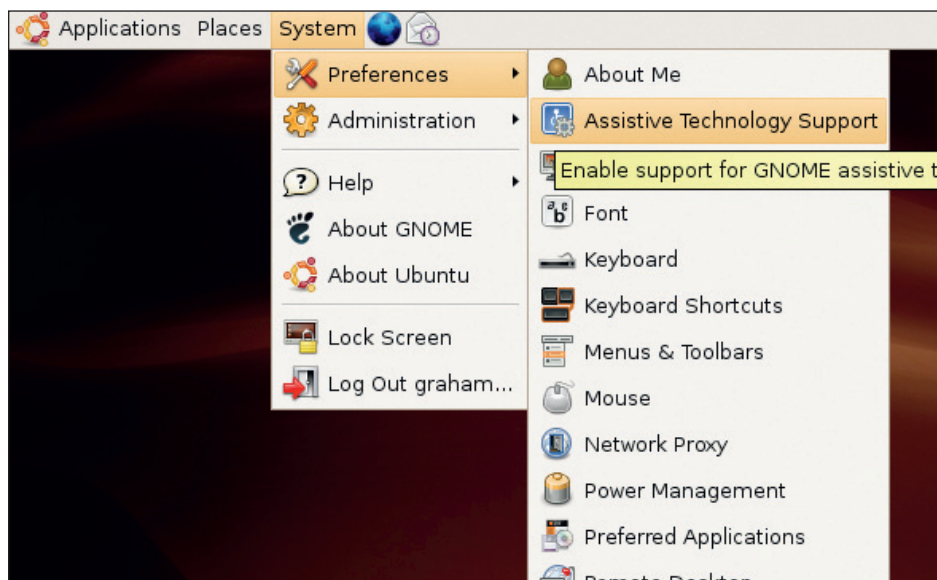
Assistive technologies will make your computer easier to use. Start at System > Preferences.

links and keyboard commands taken directly from the *Firefox* window. You can now use a pointing device or a keyboard to navigate in *Firefox* through the *Gok* interface, and in so doing, control *Firefox*. *Gok* also features its own on-screen keyboard, which you can activate by clicking on Compose in the main *Gok* window.

If you're willing to invest some time into creating a template for your own working practices, *Gok* can be an extremely effective tool. There's even nothing to stop you from creating custom hardware that uses *Gok* as the interface between the application and your interaction – nothing but the time it takes! ●

FIREFOX ACCESSIBILITY

As the web browser is probably the application you're going to be using the most, it's worth going over a few of the possibilities for making your browsing experience a little more comfortable. Like other browsers, *Firefox* can use your own font settings as well as allow you to override the design of many web pages using a custom style sheet. In Ubuntu, you can control the whole application using *Gok* (see An On-screen Desktop, *left*, for an explanation).

But the best thing about *Firefox* is the plethora of third-party extensions that can be added. There are several designed explicitly to help with accessibility, and Fire Vox (**www.firevox.clcworld.net**) is the best known. It's an open source extension that works as an intelligent screen reader. Fire Vox is able to tell the difference between common web page components such as headings, links and images, and can update web pages dynamically, rather than use a snapshot of the current page. It also uses its own text-to-speech engine for reading the contents of the page, and supports the latest CSS3 speech module for formatting spoken output.

Another important *Firefox* extension has been developed by the Campus Information Technologies and Educational Services (**CITES**) and Disability Resources and Educational Services (**DRES**) at the University of Illinois. Their work is basically a toolbar extension that provides easy access to the main accessibility functions already contained within *Firefox*, so that you can quickly switch from one scheme to another without wading through *Firefox*'s own preferences window. It makes it particularly easy to switch a badly designed style sheet. The extension also has features of its own, such as providing a list of links, headers and frames. Visit **www.cita.uiuc. edu/software/ mozilla/ document** for more details.
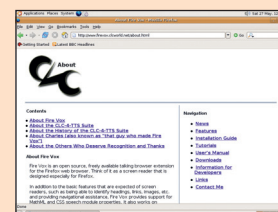
Fire Vox is an example of how responsive open source development is.

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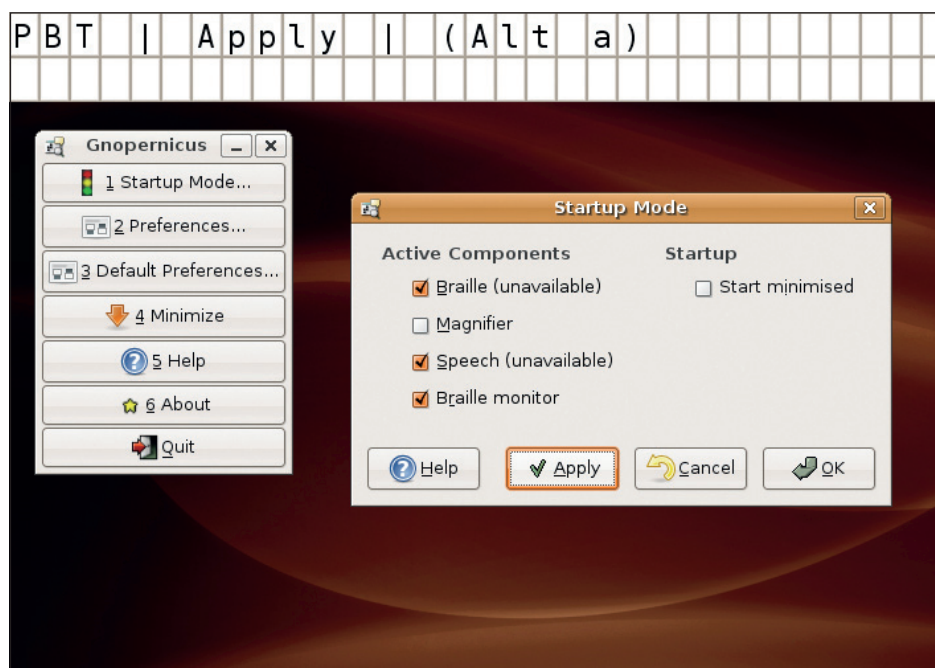
The Braille monitor with *Gnopernicus*. Find out more at www.baum.ro/gnopernicus.html.