Fedora 16

Accessibility Guide

Using Fedora with a visual, hearing, or mobility impairment

Fedora Documentation Project

Abstract

This document describes some of the hardware devices, applications, and utilities available to assist people with disabilities to use a computer with the Fedora operating system.

1. Introduction

There are approximately 500 million people worldwide with some kind of visual, hearing, or mobility impairment. Currently there are over 54 million people with disabilities in the United States alone and that number is significantly increasing as the baby boomer generation continues to age. People with disabilities often find it extremely difficult to effectively use existing and emerging technologies which are often designed without regard to their needs. Websites with inaccessible content can also be problematic for screen readers and other specialized devices used by the disabled community.

Accessible features have been voluntarily integrated into operating systems, web interfaces, and other technologies because of marketing potential or because it has been "the right thing to do." Equal access to educational, professional, and recreational technologies is rapidly becoming a legal requirement. Federal agencies in numerous countries are formulating accessibility standards. Federal requirements in the United States went into effect in June 2001.

Specialized hardware devices, applications, and utilities are available which considerably increase the usability of Linux for individuals with special needs.

2. Why should people choose Fedora as an accessibility solution?

Linux offers an inexpensive and efficient solution for the disabled community. Open source software costs far less compared to tools that run on other operating systems and Linux tools are often freely downloadable.

While the *Graphical User Interface* (GUI) is convenient for sighted users, it is often inhibiting to those with visual impairments because of the difficulty speech synthesizers have interpreting graphics. Linux is a great operating system for users with visual limitations because the GUI is an option, not a requirement. Most modern tools including email, news, web browsers, calendars, calculators, and much more can run on Linux without the GUI. The working environment can also be customized to meet the hardware or software needs of the user.

Fedora is an extremely popular Linux distribution. Most industry professionals are familiar with Fedora, making it relatively straightforward to find assistance if necessary.

The Fedora Project issues regular and frequent updates and enhancements, and computers that have Fedora installed can download and install these automatically and without cost. It is therefore easy and economical to keep computers secure and up to date.

2.1. The Section 508 Mandate

In the United States, the Section 508 Mandate is an addendum to the *Rehabilitation Act* made in 1998 that requires federal agencies to use accessible electronic and information technologies so that people with special needs have the same opportunities as everyone else.

For detailed information about the requirements of the Section 508 Mandate, visit *http://www.section508.gov/*

2.2. The Voluntary Product Accessibility Template (VPAT)

The VPAT template details how a particular product or service conforms to Section 508 criteria. The VPAT helps federal personnel adhere to Section 508 by helping them determine whether they are buying the most accessible IT products and services available. The VPAT template participation by private vendors is voluntary. These templates are hosted on the individual vendor websites. The vendors maintain their own information and the government does not endorse this information in any way.

3. Available open source tools, utilities and drivers

Current development is focusing on visual and mobility impairments. There are both software and hardware based solutions available. There are also both console and graphical solutions available, however, the graphical solutions are limited at this time.

3.1. Hardware

The biggest advantage of the hardware speech solutions is that speech is available before the operating system loads, which even makes it possible for people with a visual impairment to install the operating system. Hardware solutions include speech synthesizers, braille terminals, braille printers, sip and puff systems, and eye gaze pointing devices. These devices are usually very expensive and it is difficult to find drivers for them. Drivers are being written (mostly for speech synthesizers) for Linux but they need to be tested and integrated by the community into "upstream" software projects before becoming part of Fedora.

Jim Van Zandt has also written several servers that work with **Emacspeak**. These servers can be found in a package called *Emacspeak-ss* on Jim Van Zandt's website or linked within the *Emacspeak HOWTO*, available at: *http://slackware.osuosl.org/slackware-3.3/docs/Emacspeak-HOWTO*.

For more information on **Emacspeak**, visit *http://emacspeak.sourceforge.net/*

3.2. Software

This document focuses mostly on software tools and utilities that work with Linux. Most of these tools have been developed by the Open Source community and many have not yet been tested by the Fedora Project.

4. Screen Readers

Screen readers are important accessibility tools that allow a person with limited vision to have the computer read what is on the screen. There are numerous solutions that provide this service. This section covers some of the ones available to Fedora users.

4.1. Orca for GNOME

GNOME supplies its own screen reader, *Orca*. This package is installed by default on all Fedora systems. Additional information on *Orca* may be found by visiting *http://live.gnome.org/Orca/*.

To enable *Orca* you may run `orca` from the command line. This first time you will be asked a number of preference questions. After the initial configuration, run `orca` a second time to start **orca**. The graphical application which starts has options for changing the preferences, quitting the program, and obtaining help. During the initial setup, the questions are also said allow as they are displayed in the terminal.

Alternately, from the graphical menus select **System > Preferences > Assistive Technologies** and check the box labeled "Enable Assistive Technologies" then click **Preferred Applications** to ensure that either **Orca** or **Orca and Magnifier** is selected.

4.2. Jovie for KDE

Jovie is the KDE system for Text-to-Speech, previously known as ktts. *Jovie* consists of a Text-to-Speech Daemon, a **Konqueror** plugin, and an extension for the **Kate** text editor. The Daemon provides text-to-speech functionality to applications, such as **KMouth** and **KNotify**, via D-Bus. It also provides an icon from the system tray, for additional features. From this tray icon, *Jovie* can speak the contents of a text file, speak the contents of the clipboard, and access the control module for configuration. Comprehensive information on jovie can be found on the KDE website: *http://docs.kde.org/stable/en/kdeaccessibility/jovie/index.html*

To start *Jovie* in Fedora, run `jovie` from the command line. To start it from the KDE graphical menus, select **Applications > Utilities > Text-to-Speech.**

4.3. Speakup

Speakup is a screen review package written by Kirk Reiser and Andy Berdan and is available under a free license. **Speakup** gives users with visual or mobility impairments the ability to have audible console feedback using a speech synthesizer. **Speakup** is useful to blind users because it provides an audible installation and is fully supported by the blind open source community.

Speakup works with the following hardware synthesizers:

• **DoubleTalk PC** and **DoubleTalk LT**

- **LiteTalk**

- **Accent PC** and **Accent SA**

- **Speakout**

- **Artic Transport**

- **Audapter**

- **Braille 'N Speak** and **Type 'N Speak**

- **Dectalk External** and **Dectalk Express**

- **Apollo2**

For more information about **Speakup**, or to contribute to the Speakup project visit: *http://www.linux-speakup.org*

4.4. Using Emacspeak with Fedora

Emacspeak is a speech interface that allows visually impaired users to interact independently and efficiently with the computer. **Emacspeak** has dramatically changed how hundreds of blind and visually impaired users around the world interact with the personal computer and the Internet. A rich suite of task-oriented speech-enabled tools provides efficient speech-enabled access to the evolving semantic world wide web. When combined with Linux running on low-cost PC hardware, **Emacspeak** provides a reliable, stable speech-friendly solution that opens up the Internet to visually impaired users around the world.

Before using **Emacspeak**, you should familiarize yourself with some documentation. Start with *A Gentle Introduction to Emacspeak* by Gary Lawrence Murphy, which is available online at *http://tldp.org/LDP/espk-ug/html/index.html*

The *Emacspeak HOWTO* written by Jim Van Zandt is also a very good resource, although the document is limited to the Slackware distribution. The Emascspeak HOWTO is available online at: *http://slackware.osuosl.org/slackware-3.3/docs/Emacspeak-HOWTO*

The following sections describe how to perform various tasks using **Emacspeak** and Fedora.

> ### The Meta key
>
> At various points, the following sections refer to the `Meta` key. This key is fundamental to **Emacs** (and therefore **Emacspeak**) commands, but is very seldom found on modern keyboards. Most keyboard layouts map the `Alt` key to take the place of `Meta`.

4.4.1. Reading news using Fedora and Emacspeak

Gnus is the news reader included with **Emacspeak**. **Gnus** gets the appropriate data from the `.newsrc` file in the user's home directory. To post and read news through **Emacspeak**, refer to *http://www.gnus.org/* for manuals, tutorials, HOWTOs, and more. To start **Gnus**, press `Meta`+`X`, then type **gnus** and press `Enter`.

This command displays all the newsgroups you are subscribed to. To select a newsgroup, highlight your selection and press the space bar. Next, specify how many articles you would like to open: type

a number and press **Enter**. This splits the screen into two buffers. The top section is the summary buffer, the bottom section is the article buffer. You should now be able to read your news.

4.4.2. Sending and reading email using Fedora and Emacspeak

There are several email clients available in **Emacspeak**. The **Gnus** utility can actually be used for both email and news. Press **Meta**+**X** to start **Gnus**, then press **M** to use the mail client.

The easiest tool to use is **RMAIL**. To send a message using **RMAIL**, press **Ctrl**+**X**, then type **rmail**. When you are in **RMAIL**, press **M**. Fill in the **To:** and **Subject:** fields. Put the body of the message below the line that reads **-text follows this line-**. To send the message when you are finished, press **Ctrl**+**C** twice in succession.

To read a message using **RMAIL**, press **Meta**+**X**, then type **rmail** and press **Enter**.

For more information on using RMAIL visit *http://www.gnu.org/software/emacs/manual/html_node/ emacs/Rmail.html*

4.4.3. Using Emacspeak to execute Linux shell commands

It is not necessary to leave **Emacspeak** to execute a Linux command. To execute a command within **Emacspeak**, press **Esc**, then type **!** followed by the name of the command when **Emacspeak** prompts you. To exit the command output window, press **Ctrl**+**X**, followed by **1**

This functionality is extremely useful. You can even print and compile files you are working on within **Emacspeak**. For more information on Linux shell commands refer to *Josh's Linux Guide* or any other comparable command resource.

Josh's Linux Guide is available from *http://linuxguide.sourceforge.net/linux-commands.html*

5. Screen Magnifiers

Screen magnifiers are just what they sound like, programs that considerably magnify portions of the computer screen so it can be more easily read.

5.1. KMagnifier

In KDE, **KMagnifier**, or KMag, magnifies the area around the cursor or a user-defined area. You can also save a magnified portion of the screen to disk. Additional information can be found at *http:// kmag.sourceforge.net/*

5.1.1. Installing KMagnifier

In Fedora, **KMagnifier** is packaged in the *kdeaccessibility* package. This package also contains **kmousetool**, **kmouth**, and **ktts**, all of which are discussed in other areas of this guide. To install *kdeaccessibility* you can either select **System > Administration > Add/Remove Software** and then type in kdeaccessibility in the screen that pops up or in a terminal window type **su -c "yum install kdeaccessibility"**.

5.2. GNOME Magnifier

In GNOME, **GNOME Magnifier (gnome-mag)** can be used at the command line but is more commonly used by other client applications or assistive technologies. **GNOME Magnifier** can be enabled alone or with **Orca** through **System > Preferences > Assistive Technologies**.

6. Mouse Tools

Mouse tools allow the mouse to be used in different ways, and provide an alternate solution to people with limited mobility.

6.1. KMouseTool

A program for KDE, **KMouseTool,** provides an alternate method for clicking the mouse by clicking the mouse whenever the cursor pauses and even provides a dragging capability. **KMouseTool** works with any mouse or pointing device.

6.1.1. Installing KMouseTool

In Fedora, **KMouseTool** is packaged in the *kdeaccessibility* package. This package also contains kmagnifier, kmouth, and ktts, all of which are discussed in other areas of this guide. To install *kdeaccessibility* you can either select **System > Administration > Add/Remove Software** and then type in *kdeaccessibility* in the screen that pops up, or in a terminal window type su -c "yum install kdeaccessibility".

6.2. Mousetweaks

Similar to KDE's **KMouseTool**, GNOME's **Mousetweaks** provides functions for simulated secondary clicks, dwell clicks, and pointer capture. Additional information on **Mousetweaks** can be found at *http://library.gnome.org/users/mousetweaks/*

6.2.1. Installing Mousetweaks

In Fedora, **Mousetweaks** is packaged and can be installed by selecting **System > Administration > Add/Remove Software** and then typing *Mousetweaks*; or in a terminal window, type su -c "yum install mousetweaks".

7. On_Screen_Keyboards

Many on screen keyboards have been created for environments with no keyboards such as wearable computers or palm devices. They are also very useful for accessibility enhancement when used with a mouse or no-hand tools such as a head-mouse or an eye-tracker. Some of tools included in Fedora are described in this section.

7.1. GNOME On-Screen Keyboard

GNOME's On-Screen Keyboard or **gok** provides an on screen tool for selecting windows as well as composing input. **GOK** can be enabled as the default mobility application by selecting **System > Preferences > Assistive Technologies** then clicking the **Preferred Applications** button and selecting the preferred mobility application. Additional information can be located at *http://live.gnome.org/Gok*

7.2. Indic Onscreen Keyboard

iok is Indic Onscreen Keyboard. It provides virtual keyboard functionality. It currently works with Inscript and xkb keymaps for Indian languages. The following keymaps are currently available: Assamese, Bengali, Gujarati, Hindi, Kannada, Marathi, Malayalam, Punjabi, Oriya, Tamil, Telugu. **iok** can even try to parse and display non-inscript keymaps. Visit *http://sourceforge.net/projects/iok/* for more information on iok.

7.2.1. Installing iok

To install *iok* in fedora, you can either select **System > Administration > Add/Remove Software** on the GNOME panel, and then type iok in the screen that pops up; or alternatively type **su -c "yum install iok"** in a terminal window.

7.3. Florence

Florence is an extensible, scalable, virtual keyboard, whose sole requirement is a pointing device.

Once enabled, **Florence** displays an icon in the notification area on the GNOME Panel. **Florence** can be sent to the background when it is not needed, making it a practical solution for screens of all sizes. To toggle whether **Florence** is displayed or hidden, just click the icon. Alternatively, **Florence** can be set to autohide until an editable area is selected. **Florence** can also be configured easily to be transparent, through the **Preferences** dialogue. To edit all available **Preferences**, right-click on the icon on the GNOME Panel, and choose **Preferences** from the dropdown list.

Additional information on *Florence Virtual Keyboard* can be found at the project's homepage, *http:// florence.sourceforge.net*. Once **Florence** is installed, to view full documentation right-click on the icon on the GNOME Panel, and choose **Help** from the dropdown menu.

7.3.1. Installing Florence

Florence is available in the fedora package repositories; to install either select **System > Administration > Add/Remove Software** on the GNOME Desktop and then type *florence* in the window that pops up, or type **su -c "yum install florence"** in a terminal window.

7.4. Caribou

Gnome's **Caribou** is an on-screen keyboard that is still in development. An alternative to the **Gnome On-Screen Keyboard**, **Caribou** is still a few months away from being available as a stable release. Additional information can be located at *http://live.gnome.org/Caribou*.

7.5. Dasher

Dasher is an information-efficient text-entry interface, driven by natural continuous pointing gestures. **Dasher** is not really a "keyboard" but instead uses a zooming interface and a predictive language model with word completion. **Dasher** makes data entry easy by people utilizing a joystick, touchscreen, trackball, or mouse for one-handed operations. It can also be utilized by people using no-hand tools such as a head-mouse or an eye-tracker. Additional information on **Dasher** can be found at *http://library.gnome.org/users/dasher/*.

7.5.1. Installing Dasher

In Fedora, *Dasher* can be easily installed by either selecting **System > Administration > Add/ Remove Software** and then type in dasher in the screen that pops up or in a terminal window type **su -c "yum install dasher"**.

8. Other tools

With so many tools available to Fedora users there are some that can not be placed in a specific category but need to be listed as they are sure to be useful!

8.1. Using BRLTTY with Fedora

BRLTTY provides access to the Linux command line for blind people using refreshable braille displays. This tool provides complete screen review functionality and minimal speech capability. **BRLTTY** is available in Fedora repositories in RPM format. For information and documentation on **BRLTTY**, visit *http://mielke.cc/brltty/*

8.2. KMouth

Let your computer do the talking using **KMouth**! You can setup phrases you would like to say and your computer will speak them for you. You can even use your own phrasebooks. Visit *http://www.schmi-dt.de/kmouth/index.en.html* for additional information on **KMouth**.

8.2.1. Installing KMouth

In Fedora, **KMouth** is packaged in the *kdeaccessibility* package. This package also contains kmagnifier, kmousetool, and ktts, all of which are discussed in other areas of this guide. To install *kdeaccessibility* you can either select **System > Administration > Add/Remove Software** and then type *kdeaccessibility* in the screen that pops up or in a terminal window type su -c "yum install kdeaccessibility".

9. Help for Linux Desktops

Certain desktops have their own internal settings that can help with accessibility.

9.1. KDE

In KDE, keyboard and mouse settings can be configured in kcontrol. These settings are available by selecting **Personalization > Accessibility**. Additional information on Accessibility Tools in KDE can be found at *http://accessibility.kde.org/*

9.2. GNOME

In GNOME, accessibility controls can be configured by selecting **System > Preferences > Assistive Technologies**. Additional information on GNOME's accessibility tools can be found at *http://library.gnome.org/users/gnome-access-guide/*

9.3. XFCE

In XFCE, accessibility options for the keyboard and mouse can be configured in the Accessibility Settings dialogue. To access these settings from the graphical menus, select **Preferences > Accessibility**. Alternative keyboard configurations, such as keyboard shortcuts, can be set by selecting **Preferences > Keyboard**. Similarly, extra mouse related settings are available by selecting **Preferences > Mouse**. Some minor additional accessibility options for XFCE can be found through **Preferences > Window Manager Tweaks**.

9.4. Sugar: Making computing accessible for children.

The *Sugar Learning Platform* is an innovative learning interface for children, which encourages learning, critical thinking, and creativity. *Sugar* was originally created for the OLPC (One Laptop Per Child) initiative. The traditional "office-desktop" style computer interface can be quite intimidating and is often not very accessible for children who are learning to read and write. *Sugar* offers an alternative, more child-friendly approach to learning and computing.

To install the *Sugar* platform in fedora, you can either select **System > Administration > Add/ Remove Software** on the GNOME panel, and then type *sugar* in the screen that pops up; or alternatively type `su -c "yum install sugar"` in a terminal. There is also an alternate version of Fedora featuring the Sugar Platform, known as *Sugar on a Stick* It is available at *http:// spins.fedoraproject.org/soas/*

Various *Sugar Activities* are also available through the Fedora package repositories. To browse the available sugar activities through the GNOME package manager, select **System > Administration > Add/Remove Software** on the GNOME panel, and then type `sugar-` in the screen that pops up; you will be presented with a list of packages relating to *Sugar*. Alternatively, type `su -c "yum install sugar-"` in a terminal window.

More information on *Sugar* for learners, parents, teachers, and contributors can be found at the official website, *http://sugarlabs.org/*

10. Finding more information on Linux accessibility

The following documents offer helpful suggestions for making Linux more accessible:

- *Linux Accessibility HOWTO*: *http://tldp.org/HOWTO/Accessibility-HOWTO/*

- *Keyboard-and-Console-HOWTO*: *http://www.tldp.org/HOWTO/Keyboard-and-Console-HOWTO.html*

Additional links that might be helpful include:

- The Speakup Project: *http://www.linux-speakup.org/*

- Trace Center: *http://trace.wisc.edu/*

- Blinux: *http://leb.net/blinux/*

11. We Need Feedback!

If you find a typographical error in this manual, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla: *http://bugzilla.redhat.com/ bugzilla/* against the product **Fedora Documentation.**

When submitting a bug report, be sure to mention the manual's identifier: *accessibility-guide*

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

A. Revision History

| Revision 16.0 | Tue 8 Nov 2011 | Eric Christensen |
| | | *sparks@fedoraproject.org* |

Branched for Fedora 16.

| Revision 0.14-1 | Wed Apr 21 2010 | Gerard Ryan *mail.gerardryan@gmail.com* |

Fixed Revision History
Added information on Indic Onscreen Keyboard.
Added information on Florence Virtual Keyboard.

Added information on Jovie for KDE.
Added information on XFCE and Sugar Desktops.

Revision   **Wed Apr 21 2010**   **Gerard Ryan** *mail.gerardryan@gmail.com*
0.13-1

Grammar updates.

Revision   **Mon Mar 06 2010**   **Joseph Allen**
0.12-1   *bloggersciencewithjoe@gmail.com*

Updated section 4.3.2 to fix inconsistent instructions.

Revision   **Sat Nov 28 2009**   **Eric Christensen**
0.11-1   *sparks@fedoraproject.org*

Commented out Emacspeak sections that still need work.
Changed to be the official version for Fedora 12.

Revision   **Sat Nov 28 2009**   **Susan Lauber**
0.10-1   *laubersm@fedoraproject.org*

Made some minor readability, grammar, and style edits.
Added a number of markup additions for consistency.
Added information on enabling Orca in GNOME to the Screen_Readers section.
Added information on GNOME Magnifier to the Screen_Magnifiers section.
Moved On Screen Keyboards to their own section to clean up Other Tools.
Added information on gok (GNOME On-Screen Keyboard).

Revision 0.9-1 **Sun Nov 22 2009**   **Eric Christensen**
     sparks@fedoraproject.org

Added Gnome features Dasher and Caribou.
Commented out dated information on how Red Hat and Fedora had or had not tested some of the
FOSS solutions.

Revision 0.8-1 **Mon Nov 09 2009**   **Eric Christensen**
     sparks@fedoraproject.org

Modified the "screen readers" section.
Removed link to KMouseTools and it was broken.

Revision 0.7-1 **Sun Nov 08 2009**   **Susan Lauber**
     laubersm@fedoraproject.org

Various style edits (tense, spelling, etc.)
Added markup for menuitems

Revision 0.6-1 **Sun Nov 08 2009**   **Eric Christensen**
     sparks@fedoraproject.org

Created "Mouse Tools" section, moved KMouseTools to that section, and added Mousetweaks.

Added GNOME information in the "Desktops" section.
Added comments to Tools.xml for further editing.

Revision 0.5-1   Wed Nov 07 2009   **Eric Christensen**
                                                        sparks@fedoraproject.org

Created "Other Tools" section and added BRLTTY, KMouth, and KMouseTool to that section.
Created "Screen Magnifiers" section and added KMagnifier.
Created "Desktops" section and added KDE. This section will include specific Desktop accessibility
controls.

Revision 0.4-1   Wed Nov 04 2009   **Eric Christensen**
                                                        sparks@fedoraproject.org

Combined Speakup and Emacspeak into the Screen Readers section.

Revision 0.3-1   Thu Aug 20 2009   **Rüdiger Landmann** *rlandmann@redhat.com*
Extra XML markup.

Revision 0.2-1   Thu Aug 20 2009   **Eric Christensen**
                                                        sparks@fedoraproject.org

Updated links and added information on Emacspeak.

Revision 0.1-1   Thu Aug 6 2009   **Eric Christensen**
                                                        sparks@fedoraproject.org

Publicanized all information in the Accessibility Guide