The State of the Arts - Linux Tools for the Graphic Artist

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A long time ago, in a nerd's life far, far away....

I can trace certain parts of my life back to certain events. I remember how getting fired from a dormitory cafeteria job forced me to focus more on completing my CS degree, which in turn led to working in high tech instead of food service. I can thank the short, fat, bald egomaniac in charge there for pushing my life in the right direction. I can also be thankful he doesn't read papers like this.

Like that fortuitous event, the first time I got my hands on a Macintosh and MacPaint - I don't even remember if that was the tools name - was when my love affair with computer art was formed. I'm not trained in art. In fact, I can't draw worth beans. But I can use computers. And computers open up my creativity in ways pen and paper never quite could.

Tracing the roots of my obsession of Linux graphics, I have to go back to working for Dell Computer around 1990. My boss at the time was a fellow named Jeremy Chatfield, now at Xi Graphics. Our stint at Dell was just north of Hell, minus the actual burning brimstone. Jeremy moved to Denver, invited me up to work for a short lived company doing SVR4 for PCs, and then into a new company formed by another of our cohorts at Dell - Thomas Roell. X Inside was my first real paid gig in the world of computer graphics, though compiling Motif for various flavors of PC Unix was hardly graphically compelling. But the foundation was laid. Eventually, Jeremy played one last roll of the dice that put me over the edge - he pointed me to a new tool, called the Gimp.

Since those early days in 1994-1995, I've been an avid Gimp user and at one point even contributed a small piece of code (though I think it has been rewritten so many times my electrons have long since vanished). Gimp opened up a world that I had only been interested in previously. It let me become a participant. I even got a chance to make my first (and only, to date) trip to a SIGGRAPH show. It all led to my writing the first draft of what was then the Linux Graphics mini-Howto.

Eventually, Marjorie Richardson at Linux Journal and I hooked up for an article on graphics tools for Linux, based on my mini-Howto. It was 1995 by then. I reviewed the state of tools - rather modest at the time. I've since moved the mini-Howto, and the Linux Gazette column which it spawned, into my own graphics Web site, The Graphics Muse.

After all these years of playing, I've finally moved out of software development and write full time. It's been some time since that first look at the state of tools for graphics on Linux, and the time is ripe for another, closer, look.

I won't delve too deeply into installation issues for any of these tools. The point here is to explain what the tool options are. Once a user decides to go with Linux, they'll need dig into specific tools documentation for help on installation.

In the Out Door

Even before you work on image manipulation, be it in raster or vector formats, you'll find yourself working with photos and drawings. In order to incorporate your thoughts into these digital tools, you need a way to get them into the computer. This process can be done in two basic ways: scanning and through digital media, such as digital cameras.

Digital artists tend to start their work in one of two ways: by drawing or painting an initial version on paper, or by using photography. In either case, the initial image has to get into the computer by scanning. Linux uses a generic interface called SANE for scanners. SANE also has limited support for a few other devices like Kodak Digital Cameras and the Connectix QuickCam. SANE is actually a package of tools which includes backend device drivers and frontend user tools, both command line and graphically oriented versions. Most artists will work with xscanimage, the graphical interface to SANE which works well as a Gimp plug-in. However, you can also set up scanners to work with SANE as a network accessible device as well as access those devices, either locally or across the network, using command line tools.

> ***SANE*** supports a wide variety of scanners using a set of backend drivers and generic frontends. Some the of the scanners supported include:
> *AGFA SnapScan 300, 310 and 600*
> *Tamarack Artiscan 1200C*
> *Mustek MFS 1200SP, MFS 12000CX*
> *Microtek Scanmaker models E2, E6, E3, II, III*
> *Microtek Scanmaker 35t+ (film scanner)*
> *Kodak DC210, DC25 digital cameras*
> *Nikon LS-20, LS-1000, AX-210*
> *HP ScanJet 3p, 4p, 6200, 6250*
> *UMAX Astra 600S, 610S, 1200S, 1220S*
> *Linutype Hell Jade, Jade2*
>
> More detailed information is avialable from the SANE Backends page:
> `http://www.mostang.com/sane/sane-backends.html`
> The SANE Web site is at:
> `http://www.mostang.com/sane/`

XVScan supports, as an extension to xv, the following scanners: *HP SCSI ScanJet Scanners: PhotoSmart, 6100c or 6100cse, 6200c, 6200Cse, 6200Cxi, 6250c, 6250Cse, 6250Cxi, 5p or 5pse, 4p, 4c, 3c, IIp, IIc, IIcx, Microtek scanners E3 and E6*

XVScan is available from
`http://www.tummy.com/xvscan/.`

Table 1 - Scanner support via SANE and XVScan.

Beyond SANE, you can also try XVscan, a version of the well known XV image viewer which has scanner support added. It supports HP SCSI ScanJet scanners and a couple of Microtek scanners. XVscan is from tummy.com, runs for $50, and includes all source, if you're into that sort of thing.

But scanning is just one way to get an image into the computer. Images from digital cameras can be downloaded directly into a Linux system, just as they can on other platforms. There isn't a single driver or front end for these like SANE, but, like SANE, support for digital cameras is not depedent on the latest greatest kernel - the tools work with existing distributions.

A number of packages are available which support a wide range of cameras. Most of these are command line oriented tools, but two packages offer nice graphical front ends. Camediaplay, Photopc and Qvplay are packages which use command line interfaces. Camediaplay doesn't appear to have much online help at its web site, and is limited to a command line interface. Photopc and Qvplay are also command line oriented, but Tk based graphical interfaces are available as separate packages for each. Photopc was written specifically for the Epson PhotoPC 500 but also supports Agfa ePhoto, Olympus Sanyo VPC-G200, and Nikon Coolpix cameras. Qvplay supports a variety of the Casio QV family of digital cameras.

JCAM is a cross platform Java based interface to a wide variety of cameras. It appears to support most of the cameras supported by Photopc and Qvplay. It also appears to be a commercial or, at least, shareware package but the secure download is disabled as of the time of this writing.

gPhoto is the last option in this category. Its a free product so downloading it shouldn't be a problem. It has a graphical interface based on the popular GTK windowing interface which was originally developed for use by the Gimp project. It also appears to have support for more cameras than any of the other products. For this reason alone you might want to consider starting your search for digital camera support with gPhoto.

Product/Project	Cameras supported	Interface and Documentation
Camediaplay http://www.itojun.org/itojun.html	Sanyo DSC-X300, VPC-G200/G200EX	Command line tool which reads from serial port connected to camera.

Photopc	Epson PhotoPC 550 and related cameras	Command line tools and driver for downloading via serial port. Has a Tck/Tk frontend available from http://www.mediacity.com/~pwhite/Phototk/phototk.html End user information, with a list of supported cameras, can be found at http://www.lightner.net/lightner/bruce/photopc/ppc_use.html
http://www.average.org/digicam/		
Qvplay	Casio QV10, QV-10A, QV-11, QV-30, QV-70, QV-100, QV-200, QV-300,QV-700, QV-770	Command line tool; TK based GUI can be found at http://www.bekkoame.or.jp/~tormato/index.htm
http://www.asahi-net.or.jp/~XG2K-HYS/index-e.html		
JCAM	Kodak DC-20, DC-25, DC-200/210, Chinon ES-1000 (same hardware, protocol and image format as Kodak DC20), many others	Java application
http://www.jcam.com		
gPhoto	Largest list of supported cameras, by far.	GTK based front end and camera libraries all rolled into one.
http://www.gphoto.org		

Table 2 - Some of the supported digital cameras and applications which support them

Lights, Camera, Action

Video capture boards, sometimes referred to as frame grabbers, are another option for getting images into your system. Most of these devices are not well supported in distributions of Linux older than a year or so. Most require kernel 2.2 or later, which means distributions like Red Hat 6.0 or later or SuSE 6.0 or later. The reason: Video4Linux. This is a project aimed at making graphics-related devices (something other than ordinary graphics display adapters) easier to support. For now, however, there isn't much for the end user to play with, unless you understand how to compile and install updates to the kernel.

Most of the video capture support comes in the form of drivers only, with collections of command line tools for managing the devices. The project with the most driver and front end support appears to be BTTV, a driver for video adapters which use the BrookTree BT848/849 or BT878/879 chipsets. There are a number of nice graphical front ends to this and from an end user perspective, this would probably be the place to start if you want to look into video capture options, especially if you haven't already bought any hardware!

Bttv requires kernel 2.0.36 at least, which means users of Red Hat 5.2 could use this driver. But you have to install it manually - its not part of the 5.2 distribution. Additionally, the driver is designed specifically for 2.2.x kernels in order to work with Video4Linux. Since the 2.2.x kernels have been in most of the recent distributions, if you just got your Linux system theres a good chance this driver is already included. If the driver (which is likely to be a kernel module) is loaded, you should see devices like /dev/video, /dev/radio, /dev/vtx and /dev/vbi in the /dev/ directory.

Video4Linux is hard to understand because its not clear where its supported. The web site for this project doesn't say if this is a driver, or just a specification for drivers. I looked at the bttv driver and some of its applications and my best guess is that Video4Linux is a specification to which drivers like bttv adhere. The same goes for Video4Linux2, which is the second generation specification. Fortunately, the new version appears to provide some backward compatibilty so tools written for the original Video4Linux should still work when work is migrated to the new specification.

Along with the various video cards supported by the bttv driver, a few other devices have various levels of supports. The Iomega Buz has a driver and command line tools available for download. The support doesn't appear to be in any current distributions, and the driver requires kernel 2.2 or later. Since the driver conforms to the Video4Linux specification, it works well with XawTV and similar front end tools. The online documentation for using an Iomega Buz is quite good, better than most projects which are so early on in their lifetimes. But adding support for this device is still a task for the experienced user.

One other device of interest is an MJPEG card that is being designed from the ground up to work with Linux. The product is from Linux Media Labs and includes open sourced drivers and tools. The drivers are said to support the 2.0 and 2.2 kernels, so it should work on most distributions less than 2 years old. I couldnt' tell from the Web site if the driver conforms to Video4Linux or not, however. Interestingly enough, their web site says they're working on the LML1394 card, which will provide FireWire support for Linux.

Encrypted DVD, the type of DVDs on which most movies are distributed, was not supported on Linux until just recently, and then only with a commercial product. A driver for MPEG2 video, both using software and hardware decoding, is being written by Nathan Laredo. The project supports the Stradis Professional MPEG-2 4:2:2 decoder, which is about a $1500 card - not a consumer level device.

USB is only supported in kernels 2.2.7, which may or may not be available in recent prepackaged distributions. Information on getting this working can be found in the Linux USB Howto at http://www.dynamine.net/linux-usb/HOWTO/. Similarly, FireWire support is being developed but doesn't appear to be an end user product at this time.

BTTV **-** Driver for frame grabber cards with the Brooktree (now Conexant) Bt848/849 or Bt878/879
http://www.thp.Uni-Koeln.DE/~rjkm/linux/bttv.html
Hardware: Supports miroVIDEO PCTV, Matrix Vision MV-Delta, Hauppage Win/TV pci, STB TV PCI, Diamond DTV2000, and many others.

Applications:

> ***xawtv*** - graphical front end for TV viewing and frame grabbing.
> http://www.in-berlin.de/User/kraxel/xawtv.html
> ***kWinTV*** - QT based front end for TV viewing which started life as xawtv and was ported into the KDE environment.
> http://www.mathematik.uni-kl.de/~wenk/kwintv/index.html
> ***bttvgrab*** - video capture program http://moes.pmnet.uni-oldenburg.de/bttvgrab/

Video4Linux
http://roadrunner.swansea.uk.linux.org/v4l.shtml
I'm not sure where this is at - the web site doesn't talk about whats needed to use this. A few applications already use it, but it appears its going to be replaced by Video4Linux2. It is already distributed in most 2.2 kernel based distributions, however, and works well with the bttv drivers and XawTV.

Video4Linux2
http://millennium.diads.com/bdirks/v4l2.htm
An overhauled version of Video4Linux which is more flexible and extensible. This requires kernel 2.2.x or later. The Iomega Buz drivers are being ported to use this interface. RealNetwork's RealProducer uses Video4Linux (the original) but can stream from a Video4Linux2 device using the latters backwards compatibility layer. XAnim's author, Mark Podlipec, is apparently working on a new xanim architecture, and is considering how to integrate Video4Linux2 into it.

Both V4Linux and V4Linux2 are specifications which drivers adhere to so applications can work easily with them. bttv is included in 2.2 kernels so using the RH 6.0 and SuSE 6.0 or later distributions will make using the applications a bit easier, since the bttv driver is already included.

Iomega Buz
http://www.lysator.liu.se/~gz/buz/
There is good documentation for this, but requires a 2.2 kernel (RH 6.x, for example). It comes with command line tools, but can also work with XawTV and applications which use Video4Linux.

LinuxMediaLabs
http://linuxmedialabs.com
Builds the LML33, an MJPEG PCI card designed specifically for Linux which performs video capture, compression and playback.
vleo@linuxmedialabs.com

Nathan Laredo's ***Linux MPEG2 project***
http://mpeg.openprojects.net
Supports the high end Stradis MPEG-2 4:2:2 Decoder card - http://www.stradis.com/

FireWire for Linux
http://eclipt.uni-klu.ac.at/ieee1394/
USB for Linux
http://www.dynamine.net/linux-usb/HOWTO/
Neither quite has consumer-ready support, although USB is probably getting close.

Table 3 - Video hardware and application support

Roger, Raster. Check the Vector, Victor.

End user tools for graphics come in two primary flavors: raster based and vector based. The Gimp is a raster tool - it maintains information about individual pixels. We could talk for hours about all the new features in the Gimp, but you probably already know all that. There aren't any other raster tools currently freely available of the caliber of Gimp, though there is one commercial package that should be availabe as of July 2000: CorelDraw 9. Corel's packages are all based on WINE, the software library designed to make porting from the Windows environment to Linux easier. I haven't had much luck with tools that use WINE, but your mileage may vary.

What Gimp and CorelDraw9 really don't do well is vector artwork. Vector tools allow you to create an image that can easily scale to any size. This is essential for image design destined for print media. Linux currently has four tools of interest in this arena: KIllustrator, Sketch, Canvas and Artstream. A fifth, Corel's Ventura Publisher is scheduled for a late 2000 release.

KIllustrator is one of the packages included as part of the KDE office suite. Although fairly useful for doing diagram development, it lacks the artistic features commercial drawing tools like Adobe Illustrator provide. The same is true for Sketch.   Both tools provide the ability to add simple gradients and text along a path. Sketch seems a little more intuitive for some reason - it was easier to figure out how to import and export a file in sketch. Both KIllustrator and Sketch can be used to do reasonable vector art, but they still have a way to go on the natural media front.

Two commercial packages recently made their way to Linux: Denebe's Canvas 7 and Mediascape's Artstream. Canvas is a popular Mac and Windows application. Denebe is making use of the WINE libraries for their port. Mediascape's package is a true Unix application, having come from the SGI platform. It can requires OpenGL and can run with software only acceleration using the Mesa libraries, or it can use hardware acceleration through Mesa or one of the commercial hardware OpenGL drivers from Xi Graphics or Metro Link.

At the time of this writing I hadn't had much luck getting either application to work. Canvas crashed my X server, even on multiple hardware platforms (a desktop and a laptop) and using both XFree86 and Xi Graphics X servers for the Voodoo3 3500 card. Mediascape runs briefly, but then crashes. Both products are fairly early on in their Linux lifetimes.

With all the artwork you create, and all the stock images you acquire as part of that work, you'll need some way to manage all the images. Generically, this form of management is known as Content Management, and includes products that handle image conversion, scriptable transformations, and display.

Image conversion is handled primarily by two popular sets of tools: PBMPlus and ImageMagick. PBMPlus is a large set of programs used to convert from one format, into one of three intermediary formats (PPM, PBM, or PNM) and finally into the destination format. PBMPlus, originally written by Jef Poskanzer and extended by various individuals, has been around for years. Recently work was begun on a new version of this popular package. PBMPlus also includes a wide array of image processing tools, though all tools are designed to be used in a scripted environment and provide no graphical interface.

ImageMagick is a more integrated package that includes display and image processing tools that can be used either through a shell command line or a graphical interface. It's development has been more consistant over the years and it includes tools specifically designed for use with the Web.

There are several commercial packages available for image conversion. One of the notables is Image Alchemy. This is a native Unix package with support for a very wide range of formats.

Content management, the process of keeping track of your image files, can be done with several tools. The Gimp has a plug-in, Guash, for doing this, though it has a few arbitrary limitations such as the number of files it can handle in a single directory. XV, the very popular and long lived graphics tool for Unix systems, provides a Visual Schnauzer - a window which can have multiple instances open and allows drag and drop movement of files between them. A commercial solution also exists: Photodex's Compupic. This is, by far, the most sophisticated of these sorts of tools. It also includes a limited set of image processing functions though any extensive processing is probably better handled through the Gimp, PBMPlus or Image Magick. What Compupic does provide is a very easy to use graphical interface for managing image files.

CorelDraw 9
http://linux.corel.com/
This, like most of Corel's applications, will be dependent on the WINE libraries. Seems fairly stable in it's earliest beta releases.

KIllustrator
http://wwwiti.cs.uni-magdeburg.de/~sattler/killustrator.html
Fairly stable but limited in artistic effects. Does handle text along a curve fairly well.

Sketch
http://sketch.sourceforge.net/
Python based, with the original UI based on TK. A newer version using GTK+ is under development.

Deneba Canvas
http://www.denebe.com
Also WINE based and ported from the Mac environment, this is definitely a tool designed for artists.

Mediascape ArtStream
http://www.mediascape.com
Highly sophisticated desktop layout tool that is a native X application ported from SGI environment.

PBMPlus
ftp://metalab.unc.edu/pub/linux/apps/graphics/convert/
This is actually the NetPBM repository. PBMPlus doesn't have a download site yet, though by the time this paper is published there should be one.

ImageMagick

http://www.imagemagick.org/
Sophisticated Image viewing and manipulation package with extensive support for integration with Web applications.

Image Alchemy
http://www.handmadesw.com/
Commercial package with support for a wide variety of formats.

XV
http://www.trilon.com/xv/index.html
The ubiquitous image viewing tool for Unix systems for many years.

CompuPic
http://linux.compupic.com/
Commercial application but free for private use. This package is easily the best content management package available for Linux today.

Table 4 - Vector, Raster, and Content Management tools

The 3rd Element

The fun side of computer graphics, or at least the fastest growing side, is in 3D. There are basically two types of 3D tools: modellers and renderers. Fortunately, there are a wide variety of options for both types.

Modellers are graphical tools designed to allow users to create 3D objects and scenes. There are quite a few free tools available, which range from brand new projects to fairly sophisticated and full featured tools. Of these, the two most useful are probably SCED and AC3D. The former has a very unsophisticated look, but does provide a well thought out constraint mechanism which allows users to join objects and have them move in relation to one another. AC3D has a more sophisticated interface and supports the traditional multiview paradigm (front, side, top and 3D views).

There are a number of commercial modellers that range in price from free to around $15,000. On the low price end is Blender, a very powerful modeller and renderer that is free for use but which sells the printed documentation and tutorial CD. On the high end is Side Effects Houdini, a $15,000 3D modeller used by special effects house in Hollywood for such movies as Godzilla, Star Trek: Insurrection and Fight Club. Houdini was ported to Linux at the request of various effects houses who were already using Linux as renderfarms.

Rendering software takes the scenes created by the modelling software and turns them into actual image files. Linux has a plethora of rendering tools, ranging from home grown tools from college students to BMRT, a freely available implementation of the RenderMan specification from Pixar, to the high end, professional Maya render.

AC3D
http://www.comp.lancs.ac.uk/computing/users/andy/ac3d.html
Shareware - $40US

Blender
http://www.blender.nl
Free download software. Printed manual and Tutorial CD have to be purchased, but are well worth the approximately $80 (including shipping).

Houdini
http://www.sidefx.com
Very high end tool, not for the average desktop user.

POV-Ray
http://www.povray.org
Freeware, though it has some commercial redistribution limitations. Reads in text files that describe scenes, which means you don't really need a modeller to use this renderer, although it probably makes life easier if you do.

BMRT
http://www.bmrt.org/
Freely available implementation of the Renderman specification. A very high quality renderer. Also uses text input files, though expert users tend to mix files generated from modellers with C programs that use the Renderman API.

Table 5 - 3D Tools

Video stuff

Animation formats, like their static brethren, come in many flavors. Xanim is probably the most widely used animation viewer for Linux. It is to video files what XV is to static images - both are the Swiss Army Knives for their respective formats. Although many tools are available for playback of animations, few tools can capture individual frames. Video capture from animation files like MPEG or AVI are usually handled in what are known as Non-Linear Video Editors, a fancy term meaning you can edit a video by randomly jumping around to different frames. There aren't many of these types of tools for Linux yet. A couple of early entries here are MainActor, Broadcast 2000, Crow, and Tattoo.

Xanim, for its part, doesn't allow editing. In its standard form, it's just a playback tool. But there is an export version that can be used to convert from any of the supported input formats to AVI. A couple of other tools, ras_track and roto, deserve special recognition - they've been used by their developers in the production of a few feature length movies: Titanic and My Favorite Martian for example. These are fairly powerful tools and are currently free for download through August of 2000. Ras_track is used for 3D camera tracking. Roto is a rotoscoping tool.

Xanim
The most widely used video playback software for Linux
Standard edition
http://xanim.va.pubnix.com/home.html
Exporting edition - will export to AVI
http://www.freeyellow.com/members4/heroine/toys.html

XMovie and Broadcast 2000
Video playback and editing tools, respectively.
http://www.freeyellow.com/members4/heroine/

ras_track / roto
http://www.hammerhead.com/linux/linux.html
roto: rotoscoping program, supports motion-blurred rotoscoping
ras_track: used for 3D camera tracking, steadying shots, for marrying two shots, and for tracking an element into an unsteady shot.
http://www.hammerhead.com/index.html

MainActor
Video Editor for Linux
http://www.mainactor.com/

Crow
NLE project for Linux, in early development
http://www.crow.atu.com.au/

Tattoo Multimedia Editing Workshop
Java 2 based
http://www.tattoomicro.com/

Table 6 - Video Playback and Editing software

Image Management

You've managed to get the images into your system, you've done some editing and can view your works in both static and animated formats. You've even managed to do some video editing. But you still need to manage the images. Content management can mean tracking files, preparing them for post processing, applying post processing, or all of the above. This sort of work can be done interactively or by using command line tools.

Starting with command line tools, there are a couple of options. ImageMagick is primarily command line oriented, although there are some tools with graphical interfaces included. NetPBM is a huge collection of command line tools designed to be strung together in pipes to process images. Both ImageMagick and NetPBM offer some fairly sophisticated processing options, and both are ideal for batch processing of large numbers of files. NetPBM has been around for quite some time, with few updates, and is included in all Linux distributions. Jef Poskanzer, original author of PBMPlus, along with Greg Roelofs recently started up a mailing list to discuss and work on the next generation of PBMPlus. ImageMagick is a little newer but still undergoing constant improvement. However, it may not be included with all Linux distributions.

Both XV and Gimp allow you to manage images through the use of thumbnail previews. XV provides a feature called the Visual Schnauzer, which is a separate window you open from the main window. You can open multiple versions of the Schnauzer, which allows you to drag and drop the thumbnails (and thus move the images) between them. Gimp provides an image previewer called Guash. With this plug-in you can view thumbnails of images (in the same format that XV uses for its thumbnails) and drag and drop them between multiple Guash windows.

A more sophisticated content manager is a commercial package from Photodex called CompuPic. By far the most user oriented tool in this category, CompuPic includes features like offline management of files, image editing (such as red eye reduction), and slide shows. Its image editing features are not as extensive or generalized as Gimp's, but its file management far exceeds what Guash can provide. Its not a straight comparision between Gimp and CompuPic, since the two tools are targeted at completely different uses.

CompuPic is a commercial program, but is fairly inexpensive (about $40US) and has free downloads for private, non-commercial use.

Gimp's Guash and XV
xv
http://www.trilon.com/xv/index.html
guash
http://registry.gimp.org

NetPBM
ftp://wuarchive.wustl.edu/graphics/graphics/packages/NetPBM/
You shouldn't need to download this, as the package has probably already been installed with your Linux Distribution.

ImageMagick
http://www.wizards.dupont.com/cristy/ImageMagick.html

CompuPix
Digital Content Manager
http://www.linux.compupic.com/

Table 7 - Digital Content Management

Summary

Most of the tools discussed in this article are open source projects or products, but a few commercial products are heading to Linux as well. CompuPic and MainActor are commercial products, but are free for private use. Ras_track and roto are currently free products but it's unclear if they will remain that way. And it appers that Future DVD hardware support may come only in commercial software, unless encryption legality issues can be resolved.

You might not find these tools on the shelves of the local software retailer, but Linux does have quite a few options available to the graphic artist, no matter if you're looking at Web design, film production, or just artistic fiddling. The current state of most of these tools requires that you understand a bit about compiling software, or at least have the latest distributions from Red Hat, SuSE or the other big Linux distributors. But the growth of the graphics industry in general, coupled with the rising star of Linux, will see graphics tools of all types make their way to Linux.

If you're looking for more information on graphics tools or tutorials for Linux, take a look at the following sites:

Graphics Muse
http://graphics-muse.com

LinuxArtist.org
http://linuxartist.org

Digital Theater News
http://www.dtheatre.com/