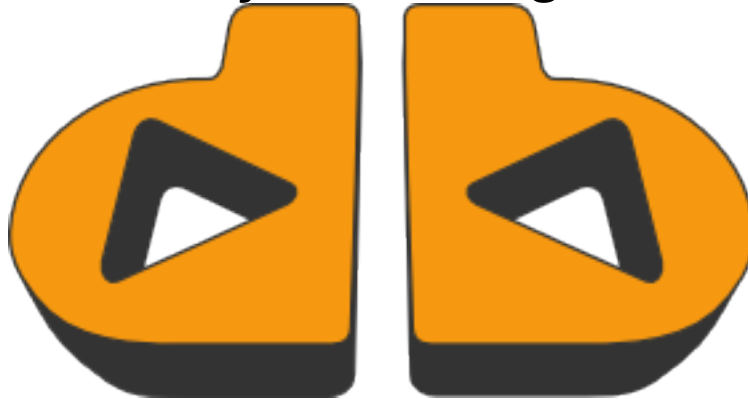# Dyne:II GNU/Linux User's Guide

dynebolic.org

Jaromil
dyne.org / rastasoft / afrolinux

Dyne:II GNU/Linux User's Guide: dynebolic.org
by Jaromil

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Chapter 1. The hacktive media

dyne:bolic GNU/Linux is a live bootable distribution working *directly from the CD without the need to install* or change anything on harddisk. It can recognize most of your hardware devices and offers a vast range of softwares for sound and video production, streaming, 3d modeling, peer to peer and filesharing, deejaying, veejaying and more.

This operating system focuses on providing *multimedia functionalities* to surf, stream, record, edit, encode and broadcast both sound and video; it also overcomes usual installation problems by providing an easy way to *run from harddisk without repartitioning*, but just copying a directory (*docking*), thus avoiding any risk of data loss and preserving the integrity of other systems you are already using.

dyne:bolic it is made by and shaped on the needs of media activists, artists and creatives to stimulate the production and not only the fruition of digital and analog informations. Empowered by GNU/Linux and the groovy open source software community, this operating system takes birth as a grassroot effort to spread free software and the spirit of sharing informations.
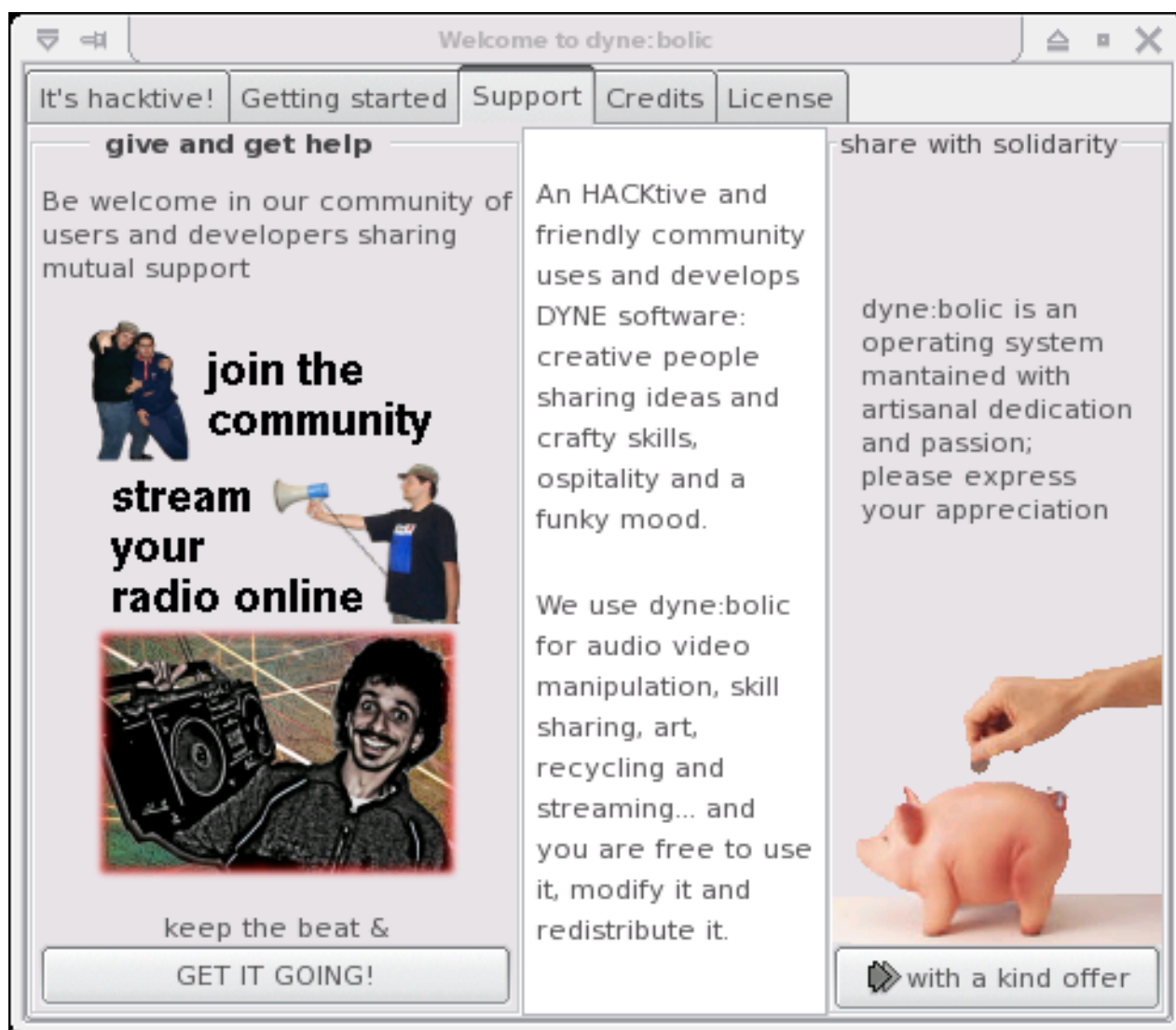
The latest version of this document is made available online at the address dynebolic.org/manual (http://dynebolic.org/manual) and in printable format at dynebolic.org/dynebolic-manual.pdf (http://dynebolic.org/dynebolic-manual.pdf). For more informations visit the homepage on dynebolic.org (http://dynebolic.org) where more online documentation is made available. To contribute you can report bugs

(http://bugs.dyne.org) and get in touch with the community of users and developers joining the the discussion mailinglists (http://lists.dyne.org) or the *irc.freenode.net #dyne* chat channel.

How to use this manual

Far from being complete in exploring the possibilities of each single software, you'll get introduced and find basic directions on how to use, modify and employ dynebolic in various circumstances.

When in need of in-deep information on how to operate a particular software, you should consult the included *man pages*.

The manpage is the name of the manual page describing usage of the program, you can use it with the *man* command from an *XTerminal* inside dyne:bolic :

```
[d:b] ~ # man hasciicam [Enter]
```

it will show an higly informative text about the usage of the program; the manpage name usually matches the name of the program executable itself.

Always keep in mind: the *man* command is your friend :) it works in every GNU/Linux system providing information about every command, and with all the commands that are around there is a lot to discover! for example have a look at manuals like "sox" or "convert", you'll find out that you can do a lot of things just from the XTerminal commandline!

At last, in case you are using intensively a certain software for your purposes, don't miss to consult its own documentation and join the community of users around it: there you can discover more about its usage and development.

This is Rasta software

Jah Rastafari Livity bless our Freedom! This is free software, share it for the good of yourself and your people, respect others and let them express, be free and let others be free. Live long and prosper in Peace!

But, no Peace without Justice. This software is about Resistance inna babylon world which tries to control more and more the way we communicate and we share informations and knowledge. This software is for all those who cannot afford to have the latest expensive hardware to speak out their words of consciousness and good will. This software has a full range of applications for production and not only fruition of information, it's a full multimedia studio, you don't need to buy anything to express your voice. Freedom and sharing of knowledge are solid principles for evolution and that's where this software comes from.

Inna babylon, money is the main requirement to make a voice possible to be heard by others. Capitalist and fundamentalist governments all around the world rule with huge TV monopolies spreading their propaganda, silencing all criticism.

This is a struggle for Redemption from existing operating systems which always require new expensive hardware for doing the same as ever: give us free players but make us pay for producing our own voices. And the one who protects you rips you off, as the Arabs say.

Dyne:bolic is a tool to produce and publish yourself, freely. There is nothing to consume here, there is all you need to create.

Commercial operating systems always give a possibility to listen - all kinds of "free to download" players, but always with

restrictions and no easy way for everybody to speak out. The way communication is structured follows the hierarchy of powers allready established in babylon's mediascapes and, worst than ever, money is the main requirement to spread a voice and let it be heard by others.

Neverthless, proprietary software spreads the dependence from business companies thru the populace: whenever we share our knowledge on how to use a certain software, we make the people in need to buy the tools from merchants in order to express their creativity. This is great responsability for anyone of us who teaches somebody how to do something with software: the need to buy will be slavery under the merchantile interests of capitalism.

The roots of Rasta culture can be found in Resistance to slavery. This software is not a business. This software is free as of speech and is one step in the struggle for Redemption and Freedom. This software is dedicated to the memory of Patrice Lumumba, Marcus Garvey, Marthin Luther King, Steve Biko, Walter Rodney, Malcom X; in solidarity with Mumia Abu Jamal and all those who still resist to slavery, racism and oppression, who still fight imperialism and seek an alternative to the hegemony of capitalism in our World.

Hic Sunt Leones. And Much Blessings in Jah Luv to All Those who still Resist. Selah.

Streamtime

Streamtime (http://www.streamtime.org) is a project of *Radio Reedflute* in collaboration with *Rastasoft*, developed with artists and activists from Iraq and elsewhere. Streamtime is a loose network of media activists dedicated to assist autonomous networking. Streamtime uses old and new media for the production of content and networks in the fields of media, arts, culture and activism in crisis areas, like Iraq.

We imagine improvised expressive devices like a CD that turns your PC into an on line streaming studio. Imagine a mob that creates a traffic jam. Think of the religious policeman in London, the konfused kollege kid and the jealous dentist in Baghdad and the jailed blogger blogging on in Cairo. Building autonomous networks in extreme conditions.

Streamtime uses old and new media for the production of content and networks in the fields of media, arts, culture and activism in crisis areas, like Iraq. Streamtime offers a diffuse environment for developing do-it-yourself media. We focus on a cultural sense of finding your own way in the quagmire that is Iraq, and its representation in the global media. We should not try to change politics in order to foster cultural change; we should support cultural manifestation in order to force political change.

Streamtime may take the form of a campaign, a work of collaborative art, a current of unheard sounds, unspeakable words and unseen imaginations. Remote interaction and ubiquitous dialogues, dematerialized communication and participation on the streets. Space in its territorial, acoustic and cybernetic dimensions is fragmented and recomposed realtime. Hacking codes both moral and digital, forming new maps, mutant drawings and unstable skins. Information overload can be abandoned in favor of consciousness and collaborative practices. Memory has a digital, diverse, horizontal voice.

Privacy and freedom of expression

The distinction between what is public and what is private is becoming more and more blurred with the increasing intrusiveness of the media and advances in electronic technology. While this distinction is always the outcome of continuous cultural negotiation, it continues to be critical, for where nothing is private, democracy becomes impossible (quote from Privacy Conference, Social Research, New School University).

The internet offers plenty of free services, on the wave of the Web2.0 fuzz and the community boom, while all private informations are hosted on servers owned by global corporations and monopolies.

We urge you to reflect on the importance of keeping privacy for personal data. Our present world is full of prevarication and political imprisonments, war rages in several places and media is mainly used for propaganda by the powers in charge. Some

of us face the dangers of being tracked by oppressors opposing our self definition, independent thinking and resistance to omologation.

People have the right to protect their privacy as much as their freedom to express.

It is important to keep in mind that noone else than *you* can ensure the privacy of your personal data. Server hosted services and web integrated technologies gather all data into huge information pools that are made available to established economical and cultural regimes.

Since version 2.4 in this free operating system was introduced support for strong encryption of your /home private data with Linux dm-crypt i586 optimized Rijndael hashed SHA256, to provide an efficient and user-friendly tool to protect your bookmarks, addressbook, documents and emails by carrying them back with you, protected with a fairly strong cryptographic algorithm.

A passkey to read your data is stored inside a file, which is also protected by a password. It is possible to keep everything with you on a small usb stick, still being sure that the data won't be easily recovered in case you loose it. You can also give the passkey protecting your data to a friend, to make the data unaccessible until you meet again, which can be useful in case of tricky transports. You'll find more informations in the following sections about nesting and privacy.

License and disclaimer

The dyne user's manual is copyright (c) 2003 - 2007 Denis Rojo aka Jaromil (http://rastasoft.org)

Thanks for reviewing and inspirations go to the Streamtime crew, all the bloggers from Baghdad and any other crazy place in the world where people like us happens to be living, has to live it, and can even find a way to survive.

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dyne:bolic GNU/Linux is copyright (C) 2001 - 2007 Denis Rojo aka Jaromil (http://rastasoft.org)

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Chapter 2. Discover the dyne:bolic system

Your desktop environment

Dyne:bolic doesn't requires to install anything on your harddisks, which can be left untouched while the system is used. Still, depending from your preferred way to operate, it can boot from CD, USB or harddisk and it can store data in a single file that can be transported across different media. The whole operating system fits on a single CD, to run it from harddisk you just need to copy the DYNE directory in it (see docking), while in a diskless thin-client setup that can also be mounted via network. This makes dyne:bolic very easy to be employed and mantained, while there is no risk for misconfiguration: the system comes as it is, providing a slick desktop full of applications ready to use.

The default desktop manager is Xfce (http://www.xfce.org), it offers you multiple desktops (try ctrl+F2 and other numbers) and a menu that you can recall by clicking the right mouse button on the background. On the upper right corner you have your storage devices which you can access with a click.

Inside the application menu software is organized by tasks, so you can easily find your way to play, record, edit and stream both audio and video, communicate and publish text, webpages, 3d animations and much more.

Click on *CONFIGURE* in your menu to access system configuration facilities and customize your system.
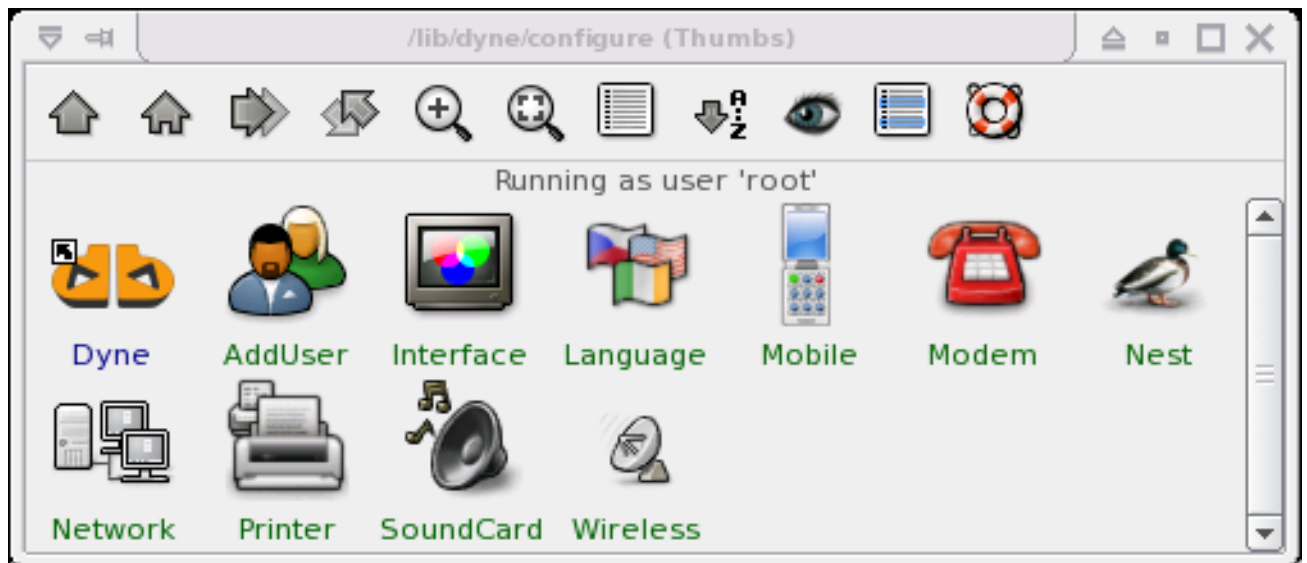
To be introduced to various desktop functionalities you can visit Spot's homepage (http://spot.river-styx.com/viewarticle.php?id=8) and read the OSNews dyne:bolic review (http://www.osnews.com/story.php?news_id=6490).

Access your data volumes
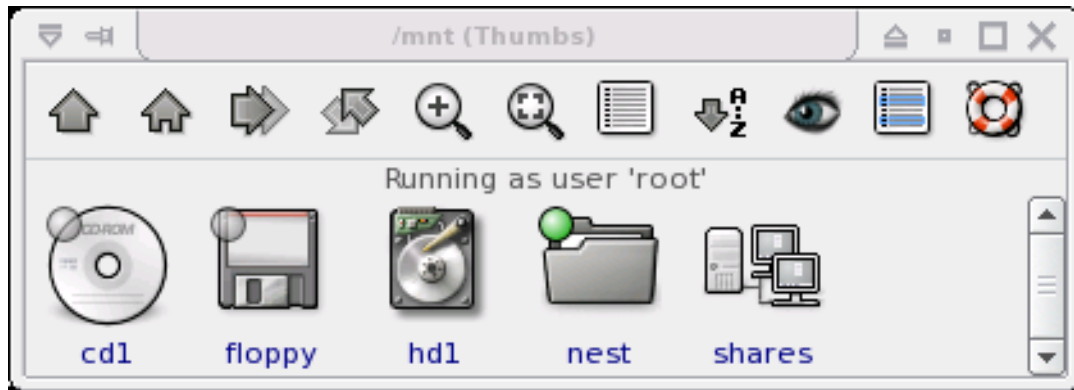
You can easily access your files on connected storage devices (harddisks, cd, floppy, usb) using the buttons in the upper right corner of your desktop, as well your local network shares and remote internet accounts. Your partitions are automatically mounted in the */mnt* directory, which you see linked in your home as *Volumes*. You can read and write on all your volumes except for NT filesystems, which you can only read.

Usb storage devices (like usb pens, smartcards and some digital photo cameras) can be opened simply with a double click on the usb symbol. But beware that sometimes unusual partition schemes can confuse the autodetection, so you can try by hand in a Xterminal issuing manual commands:

```
[d:b] ~ # mount /dev/sdXY /mnt/usb [Enter]
```

Where you must substitute X with letters (a,b,c...) and Y with numbers (1,2,3) for example */dev/sda2*.

If you have only one cdrom or dvd player on your computer with *docking* you can have it free for use after booting dyne:bolic (see following chapter about DOCKING), then you can access, browse, play and rip compact discs and dvd.

To have a general overview about the organization of various directories you find in GNU/Linux systems, read the manual *hier* (type "man hier" in the Xterminal).

Nest your home and settings

By default your */home, /etc and /var* directories reside in RAM memory: every file and configuration you save will not be there again at the next boot. To save your home and settings permanently you need to create a *NEST*: it is just a file called "dyne.nst" that can be placed on a harddisk or usb storage device and it loaded at every boot. You just need to create your nest once, dyne:bolic looks for it at every startup and if it is present starts using it automatically.

The *nesting* function is very practical to keep all the modifications you make to the system while using it (settings, saved files, accounts, language, private data etc.) and transport or backup them. For example, in case you nest on your USB stick, you can boot with it connected at startup, then that nest will be used and all your /home and settings will always stay with you, in your personal USB stick. This way you don't even need a laptop to travel around with your software environment and data, just carry a dyne:bolic CD and your nested USB stick with you, wherever you'll be able to boot it you'll have your /home.

*How to create a nest?* at the boot screen or in your *Home*, click on the *Configure* button, then choose *Nest* (the little icon of a duck). You will be prompted to create a nest on your harddisk or USB stick, proceed choosing the partition you want and how big you need it: good sizes may vary between 250 and 500 megabytes, depending from how much you plan to use the system, modify it and open it for other users.

Since version 2.4 when creating a nest you'll also see a padlock button: press it and your new nest will be secured with encryption, you'll be asked to set a password, which will be then asked at every boot when you mount the nest. Without that password it will be very hard to access your nest, so you'll be granted with fairly good security for your personal data.

If you nest on harddisk, the supported partition formats are: Dos, Fat32, Ext2, ReiserFS, Beos (BeFS) and BSD (UFS), but not NTFS. The nest is just one file created in the /dyne directory at the root of your partition (C:\ or D:\ in the DOS filesystem) called *dyne.nst*. To erase a nest simply delete that file.

Install on harddisk? Dock!
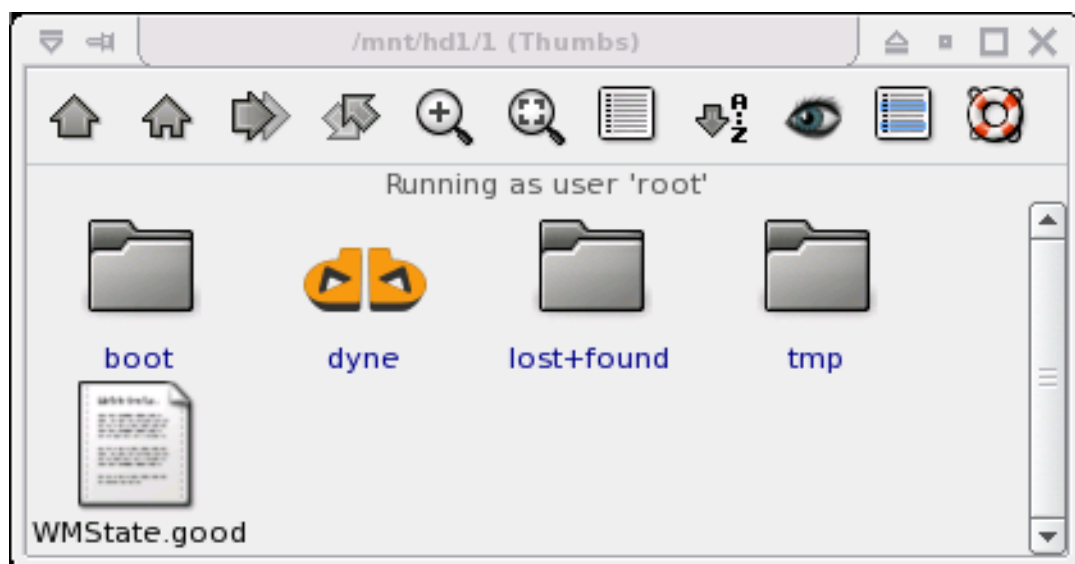
Dyne:bolic solves the problem of istallation in a very simple way: there is no installation :) you simply copy a directory and

this is called "docking".

Docking lets you run the system from an harddisk, with shorter load time and more speed. With a dock you can also boot from floppy, or from a multi-boot partition.

Docking consists of copying the dyne/ directory from the CD to the harddisk. You don't need to change anything in your partition, just copy a directory into it: drag the dyne/ folder from the CD on the icon of your harddisk, that's it! It will occupy less than 700 megabytes of space. After 'docking', you can boot with the CD inside and it will eject automatically after the first phase of the boot process, this is the sign the dock went well! Like that, even without the need for repartitioning or configuring a double boot, you can just switch to dyne:bolic using a CD or a floppy, but still run it from harddisk at full speed, like an installed operating system - and even better! ;)
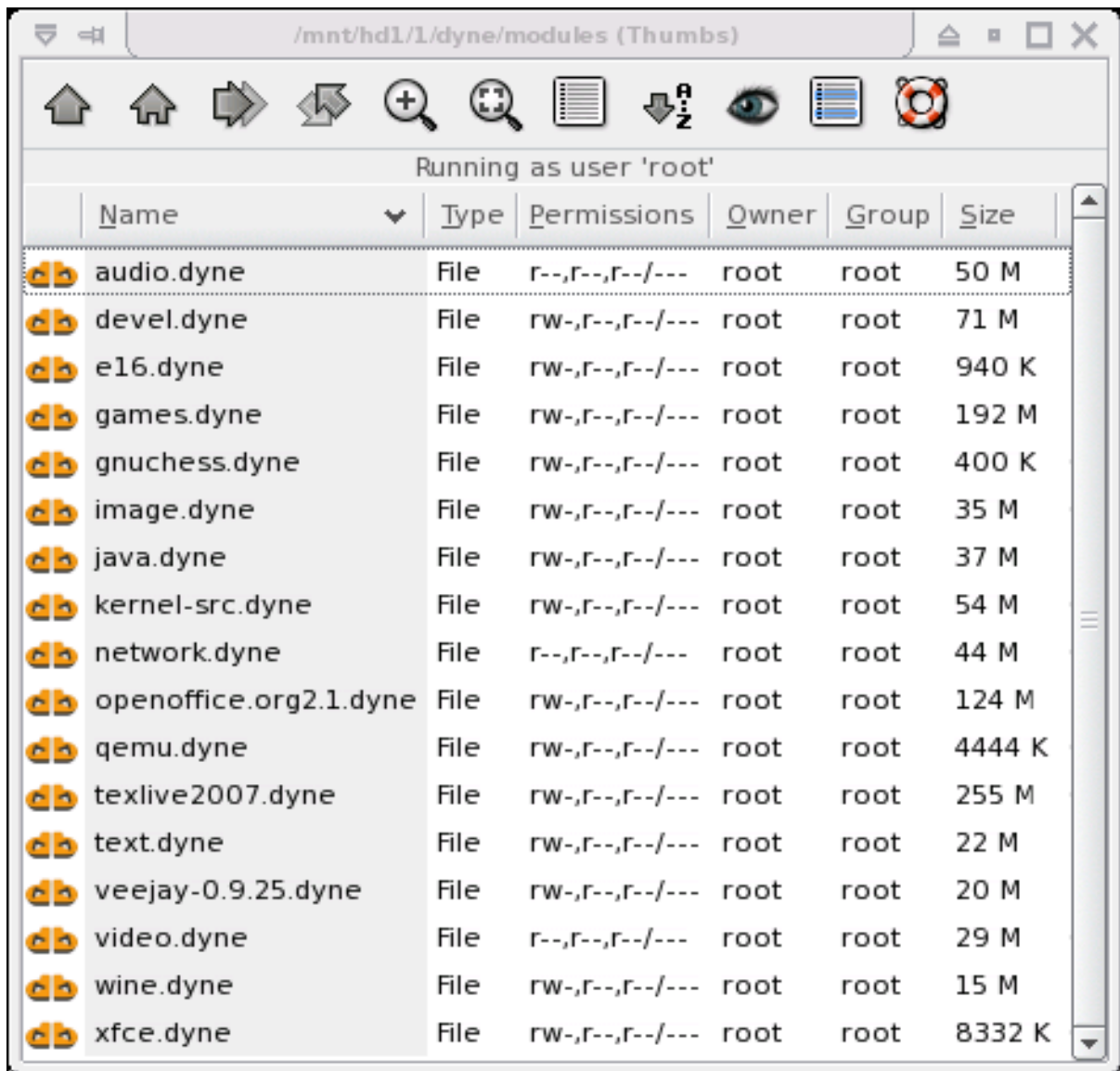
Of course when you want to remove the dock is easy: just delete the /dyne directory in your harddisk!

Remember that docking is different from nesting: *Docking* is done to run the system and all application from harddisk instead of CD, *nesting* is to store your home and settings in a single file on harddisk or usb storage.

More online information about docking is available on the wiki community pages (http://lab.dyne.org/Docking).

Extra software modules

Dyne:II offers the possibility to be expanded using *.dyne* modules: collections of applications that can be easily installed and used. In fact the basic system already contains some of these modules, that can be found in your dock as the *dyne/modules/* directory. From the menu, you can see them clicking thru *CONFIGURE -> DYNE -> MODULES*

Name	Type	Permissions	Owner	Group	Size
audio.dyne	File	r--,r--,r--/---	root	root	50 M
devel.dyne	File	rw-,r--,r--/---	root	root	71 M
e16.dyne	File	rw-,r--,r--/---	root	root	940 K
games.dyne	File	rw-,r--,r--/---	root	root	192 M
gnuchess.dyne	File	rw-,r--,r--/---	root	root	400 K
image.dyne	File	rw-,r--,r--/---	root	root	35 M
java.dyne	File	rw-,r--,r--/---	root	root	37 M
kernel-src.dyne	File	rw-,r--,r--/---	root	root	54 M
network.dyne	File	r--,r--,r--/---	root	root	44 M
openoffice.org2.1.dyne	File	rw-,r--,r--/---	root	root	124 M
qemu.dyne	File	rw-,r--,r--/---	root	root	4444 K
texlive2007.dyne	File	rw-,r--,r--/---	root	root	255 M
text.dyne	File	rw-,r--,r--/---	root	root	22 M
veejay-0.9.25.dyne	File	rw-,r--,r--/---	root	root	20 M
video.dyne	File	r--,r--,r--/---	root	root	29 M
wine.dyne	File	rw-,r--,r--/---	root	root	15 M
xfce.dyne	File	rw-,r--,r--/---	root	root	8332 K

Additional dyne modules are available online on the dynebolic.org homepage in the *Modules* section. Download and activate them just dropping the .dyne files into the dyne/modules docked directory. Then reboot, that's it!

Users can easily keep their modules across different machines, always finding back the software they need. Modules can also be used thru different dyne versions: just update the core dock and then drop in your good old modules.

Download free and open source dyne modules online from http://dynebolic.org, there are many interesting extensions already: pure:dyne (http://puredyne.goto10.org) (Pure-Data and other digital art tools), Open Office (all you need to handle office documents), Devel (more development tools) and there will be the Games modules soon, don't worry ;)

Developers wanting to create modules for certain software collections can refer to documentation online at dev.dynebolic.org (http://dev.dynebolic.org) which includes all necessary informations on how to do that.

Boot from harddisk

With docking we saw that simply moving a directory in the root of a partition can let us boot from CD and run from harddisk. This is a very simple and safe way to have a dual-boot system: Cd in for dyne:bolic, CD out for anything else. Still some people really likes to get rid of the CD, so here it is explained how.

Keep in mind that *the following operation is not necessary to run dyne:bolic from harddisk*. If you are not familiar with boot sectors and partition geometry you might need the intervention of an expert when anything goes wrong. Furthermore, in case of a mistake you might delete all the data stored on your harddisks and/or be left without the possibility to boot back into your old operating system.

In order to boot from harddisk you need a bootloader (Lilo or Grub) installed. We recommend the use of Grub for its simplicity and flexibility: in fact that is the default bootloader dyne:bolic will install for you, but in case you have Lilo already installed and you don't want to change it, then there is also a way to add a dyne:bolic entry to it.

The following instructions will cover various situations: you can omit some operations in case your computer is already setted up with them.

In case you are installing a computer from scratch, without anything installed on it yet, then you need to partition the harddisk and format it. You can do so using the command *cfdisk* to create or modify your harddisk partitions, then *mke3fs* to format the partitions (or other mk* commands in case you desire to use a different filesystem than Ext3). *Beware that this operation above will erase all the data on the disk*.

Once you have a disc partitioned and formatted you need to install the bootloader. To do this use the command *grubconfig* and follow the steps you are prompted, at the end of the process you will be able to boot your computer directly into dyne:bolic, without the need to use a CD.

To re-configure your bootloader (not necessary if you installed one from scratch using dyne:bolic) go look into your harddisk partitions, in case you have a directory boot/ see if inside there is another directory called grub/, if yes there you found your grub configuration, a simple text file called grub.conf or menu.lst which you have to edit by hand, adding a few lines at the bottom in order to add dyne:bolic among the boot menu selection:

```
title dyne:bolic RASTASOFT Afro Linux
root (hd0,0) # ADJUST THIS!
kernel /dyne/2618ck1d.krn root=/dev/ram0 rw load_ramdisk=1 max_loop=64 vga=791
initrd /dyne/initrd.gz
```

After doing that you'll need to set the harddisk where you have docked: where it says "ADJUST THiS" change the *(hd0,0)* if necessary: hd0,1 for hda2 - hd0,2 for hda3 - hd1,0 for hdb1 and so on... trying wrong values is not dangerous and in case you are confused there is a lot more documentation about this process in the grub manual pages.

In case you have installed lilo, search among your harddisk partitions for the directory etc/ and then inside for the lilo.conf file, if found then add the following lines at the end of it:

```
image = /dyne/2618ck1d.krn
  root = /dev/ram0
  append = "max_loop=64"
  initrd = /dyne/initrd.gz
  label = dyne
  read-write
  vga = 791
```

Being sure that the /dyne directory is inside the partition you boot, which in lilo is configured by the *boot = /dev/hd** usually at the beginning of the lilo.conf file. Please note the "image =" parameter takes a full path to the kernel file, which is named after it's version in a condensed form, for instance here 2618ck1d stands for 2.6.18-ck1-dyne . The condensed format is necessary for a 8.3 filename restriction of the isolinux CD boot system.

Happy hacking ;)

Boot from network

Network booting is supported on some personal computers: the PXE system was included on some BIOS already at the beginning of year 2000 (rough estimation): if no harddisks or cd devices are found to boot, the first black screen of the computer will search for a PXE boot on the local network.

When booting PXE looks for a DHCP server on the local network for an address assigned. When found it will connect via TFTP to receive the kernel and the ramdisk from that server or another one.

To start a TFTP server distributing the current docked dyne:bolic system, it is enough to run this command in a terminal:

```
[d:b] ~ # tftpd -l -c $DYNE_SYS_MNT [Enter]
```

You can also configure a DHCP server to provide the network addresses to any PXE client booting. To do that use the graphical program *gdhcpd* starting it from a terminal, or the sample configuration file in /etc/dhcpd.conf. See *man dhcpd* for a reference to how to launch and operate the DHCP daemon.

Keep your data safe

Dyne:bolic is developed with your privacy in mind: as mentioned before the NEST can be encrypted to make your private data unaccessible unless your password is provided, now we'll proceed to analize in deep all the aspects of this security measure.

When an encrypted nest is created, every file you place in your home directory will be preserved in a scrambled form using a Rijndael/SHA256 algorithm: such a cypher can be considered very secure, maybe some military organizations are able to break it, but anyway that would be very expensive in terms of resources employed.

Dyne:bolic encryption mechanism employes a passfile "dyne.nst.gpg" which contains the cypher used to protect your data: that file holds the password that, matched together with your dyne.nst file, can access all the data you store in your nest. So actually that file is very precious for your privacy, you should be careful and not copy it around.

Since the passfile is so delicate, it is also protected with a password: the one you choose at the beginning, which is used to scramble the passfile through a CAT5 algorithm. Keep in mind that this cypher algorithm is weak and eventually, in case an intruder takes possession of your .gpg passfile, crack the protection on your data will be easier.

Now in practical terms all this encryption scheme means that you can safely move around your dyne.nst file alone without the dyne.nst.gpg passfile, there will be no intrusion in the data stored inside even in case you loose it. It also means that you can give your passfile to a friend, still protected by the password you memorized, so that neither you nor your friend will be able to access the nest until you meet up again. More in general, this scheme lets you separate your encrypted data from the passfile, still keeping everything sealed by the password you keep in mind, and move the data around in different places being sure meanwhile it's not accessed by anyone else.

So for sure we can say our privacy protection is way above the usual schemes used in most common operating systems, which keep your data in clear and physically accessible.

For the curious hacker

Now if you are wondering what's inside to make it work like it does, you are very welcome to discover it, dynebolic is free software! and hackers more familiar with GNU/Linux systems will easily recognize the architecture.

A dyne:bolic SDK is available, it is the one used in development, and there is a brilliant introduction on how to use it on Spot's site: http://spot.river-styx.com/viewarticle.php?id=18 plus plenty of documentation in the dyne:bolic developers

lounge (http://dev.dynebolic.org), along with revision of every single modification done to the system during development phases.

Chapter 3. Video production

Play, record, edit and stream your video

The GNU/Linux platform nowadays offers an interesting range of tools for video production, editing and manipulation; you can play all kind of video files and DVDs, but also encode them for distribution and switch between formats. Furthermore, you'll find software for recording, veejaying and streaming, non-linear editing and subtitling.

However, you should consider that most of the video tools running on GNU/Linux platform are in development: indeed you can help much in testing and reporting the bugs you encounter, that's how anyone can help free software to grow better and better, as it does.

Now lets proceed on how to configure an available video device and then browse thru the video software included in dyne:bolic, following a subdivision in task categories.

Configure your video devices

There are various devices that can be used on PC computers in order to have video input: USB webcams and capture cards, PCI TV cards, Firewire and even parallel port. They all have different chipsets and manufacturers and need different Linux device drivers.

Dyne:bolic is capable to automaticly recognize most PCI (internal) TV cards at boot time (WinTV, BTTV) and now also USB webcams as well Firewire controllers: they will all be initialized at boot and can be accessed from the video device */dev/video0* or subsequent numbers (video1, video2 ..) in case you have more than one.

If your video device is not recognized automatically (the /dev/video doesn't exists) then you need to configure it by hand. In case of USB webcams a good place to start looking for hints is the linux-usb website (http://www.linux-usb.org). Also the Spot's guide about rolling your camera (http://spot.river-styx.com/viewarticle.php?id=16) is a good place to visit for more informations on how to proceed.

If the online documentation says your device is supported by a particular kernel driver, you can try to load it using the command '*modprobe modulename*' and see if everything went well by looking in the last lines of the messages printed out by the *dmesg* command. Many modules are already present in dyne:bolic, but some might require to be compiled using the kernel sources, which is a more complicated process that can't be explained here: you'll need to find more instructions online about how to do it and download the dyne:II kernel sources using *dyneSDK* (see the DEVELOPMENT chapter about it).

VeeJay

The VeeJay applications implement a pioneeristical approach to video manipulation in realtime, taking advantage of the high computational power offered by personal computers nowadays. If you're active in the field of media and visual art, dance or scenografy, this software can be interesting and sometimes very useful to your research.

FreeJ is also a dyne.org rasta software that Jaromil started writing in 2001, collecting video compositing tecniques developed in theatre and interactive installations. It is still in development, but it's allready usable and offers multiple approaches to realtime video manipulation: can be controlled lively and from a remote console (VeeJay over Ethernet!) or scripted in an object oriented syntax (JavaScript). More documentation is available online about FreeJ: manuals and a user friendly tutorial (http://lab.dyne.org/FreejTutorialPiotr_01), can be found online at its homepage on freej.dyne.org (http://freej.dyne.org).

Other tools included in dyne:bolic are useful to be employed in different ways on realtime video: *EffecTV* can apply realtime effects to images, one by one, realizing "distortion mirrors" and other possible funny uses; *Xaos* can let you explore the psychedelical word of chaos mathematics and fractals :)

A remarkable piece of software is *Pure Data* which together with various extensions realizes a tool to connect various processing units in a visual scripting fashion, to create visionary audio machines and interactive video tools. Pure Data, also called PD, is as powerful as complicated to learn; it helps the fact that is getting now adopted by various media-art schools around the world as a free and open source for students to realize their projects. From the wide community of digital artists and creatives using it in all kinds of interactive installations and performances, the Goto10 crew joined the development of dyne:II to implement the *pure.dyne* software module which provides you everything you need to start using Pure Data right out of the box, without installation problems: check their website at http://puredyne.goto10.org to download a copy and add it to your dyne:bolic system.

Play

Players are provided to playback various video formats as AVI, MPEG, DIVX and WMV files, signals from TV cards or Quicktime, RTSP and HTTP live streams from the net. At the time being, dyne:bolic is compatible with most of the video formats around: thanks to *MPlayer*, *Xine* and *FFMpeg* free software you have chances to view files otherwise unsupported by other proprietary systems. Xine is recommended for watching DVDs, while Xawtv is a fully featured television viewer. Mplayer will be used to playback videofiles whenever you'll doubleclick one in the file manager (to close mplayer then you have to press 'q').

Record

Video recording is supported using a vast number of devices: from TV/video card and DVD using *MEncoder*, a commandline tool to be used from an XTerminal, a bit complicated but very powerful, see it's manual. An user-friendly interface for DV acquisition via firewire is provided by *Kino*; while *XawTV* supports all other types of video devices and can be good to check if your is recognized as it has the widest support for hardware.

Edit

Inside dyne:bolic you'll find *Cinelerra*, which implements a common approach to non-linear editing, with a nice user interface, speed and responsiveness.

You can be introduced to *Cinelerra* by the manual available on manual.cinelerra.org (http://manual.cinelerra.org) or this online tutorial (http://www.robfisher.net/video/cinelerra1.html).

Also *AviDeMux* is a useful tool for quickly cutting video, supports even more input formats than Cinelerra and can be used to convert between some formats and do simple editing tasks.

Consider that video editing tasks are the most demanding, so you'll need a relatively fast computer (from 2004-2005) in order to achieve decent interactivity and satisfactory results.

For converting between video formats its included the powerful *Transcode* tool, which is a commandline application that can be scripted to convert large number of files or easily accessed via a graphical interface.

Stream

Streaming video can be easily setted up in three different ways: using *Mpeg4IP*, *FreeJ* or *HasciiCam*.

With *Mpeg4IP* you'll stream in Mpeg4 format and you'll need an online server running Darwin broadcast software, the resulting stream can be watched with most video players available today on various platform. This method provides good

quality and smooth framerate, can record while streaming, efficiently uses bandwidth when running on multicast and can stream audio synced with the video. It's drawbacks are that it can be hard to find or setup a broadcast server, slower machines can't stream neither play it (cpu intensive).

With *FreeJ* you can combine different video sources, apply effects and overlay text, put transparent images and even more, then all the resulting stream can be live encoded with the free Theora codec and sent to an Icecast2 server online, this way anyone will be able to take your stream from the internet and play it back for example using the VideoLan (http://www.videolan.org) player available for all computer platforms. The capability of mixing and effecting the video realtime is a unique feature of FreeJ, but the drawback can be the initial difficulty you can encounter in mastering the program, which has to be started with particular flags from an XTerminal in order to activate the streaming functionality. To find out more about it see the previous section about VeeJaying and check the Streaming with FreeJ (http://lab.dyne.org/FreejStreaming) documentation online. As a reference, this here are the commandline options to be given:

```
[d:b] ~ #freej -s [resolution] -T [theora_quality] -V [vorbis_quality] \
-i http://server:port/mountpoint.ogg -p password [ .. other options and files]
```

Hasciicam is another Rasta software, the first one Jaromil ever published (2000), distributed by dyne.org. It is capable of rendering a video into text, having letters in place of colors, filling up the image as a greyscale palette. With such an encoding the images look way less detailed, but pretty cool, and the stream uses very low bandwidth: Hasciicam can upload video via ftp to a server and can be viewed directly from any web browser (also text based) - so it can work to provide a video stream even using very old computers, and adds a special bit to it: the ASCII chars. As drawbacks here we have that the video is formed of characters: nifty, but doesn't gives a clear picture, it is just monochrome and can't achieve a smooth framerate on movement.

A documented research on the topic of streaming video with free software is being mantained by Jaromil and is published online (http://montevideo.dyne.org) as part of his academic activity.

Chapter 4. Audio production

Play, record edit and stream your audio

This distribution is full with audio software to do all kind of things: electronic music, sound processing, voice effects, interviews and more. And there is one important thing that makes this system superior to any other commercial solution: there is no competition :)

Most of the audio applications in dyne:bolic can be connected together, input to output, in order to form a chain of tools processing the sound: this is done thanks to a technologies like JACK and the Advanced Linux Sound Architecture. Instead of keeping separated the tasks of every single application, now it is possible to take advantage of the great variety of approaches that a GNU/Linux system like dyne:bolic has to offer.

This revolutionary approach will surely pay you back the effort to be introduced to its use, a good starting point is the Spot perspective on technology at http://spot.river-styx.com/viewarticle.php?id=14 and http://spot.river-styx.com/viewarticle.php?id=17.

Play

This operating systems provides players for many audio formats available around out of the box: WAV, MIDI, MP3, OGG / VORBIS, MOD, XM, FLAC, SPEEX and even more can be played out or re-encoded, switching between formats.

The *Xmms* player is a practical audio player with a minimal and intuitive playlist manager, can play online radio streams and local files and can be skinned or customized with plugins as you like.

Amarok is a fully featured personal jukebox, handling the collection of your audio and downloading automatically printable lables and lyrics of your favourite music. Let it explore your collection of audio so that it will let you search for keywords, memorize your preferences and guess playlists out of your favourite music. It makes it a perfect interface for a jukebox station!

Timidity is a midi synthetizers using GUS patches to render your MIDI files into audio files, as well make you listen to MIDI partitures.

MikMod is a tracker module player (file extensions as MOD, XM, S3M etc.) which can let you listen to demo-scene prods, video game music and what's commony called "chip tunes".

Perform

This section includes software to produce live music, interacting in realtime with the applications that generate sound out of microphone, midi, keyboard and mouse inputs. All this software requires Jack to work properly, so that it can be interconnected in a chain of programs, like a virtual rack of different applications.

Hydrogen is a drum-machine where you can load sample kits of instruments and compose a partiture for them to play on a specific rythm. It's homepage offers a collection of many more drum kits you can download, go to http://www.hydrogen-music.org.

Jamin is the Jack audio mastering interface, it can perform professional audio mastering of stereo input streams, equalizing signals with an intuitive and advanced interface to shape all frequencies in realtime.

Jack Rack is a powerful effect rack that can apply chains of audio plugins (LADSPA) on the sound currently being played by other programs. Using Jack you can interface it with all other performance tools and add one of the more than 200 effects available in dyne:bolic.

FreeWheeling is a funky application that lets you record and play multiple samples in realtime, so that they stay looping and can be overlayed one after the other: is a fresh tool to manipulate, sum and and create over recorded sounds, but requires you to read some instructions before start using it, since it's all controlled via keyboard (and, optionally, midi).

Record and edit

This version of dyne:bolic comes with up to date software to record and manipulate audio: it is generally more stable and feature rich than the previous, so you'll hopefully notice the improvements while using it.

Ardour is the fully featured multitrack studio that offers the most advanced interface for your music recording studio. Combined together with other applications when necessary (it also uses Jack) it can really solve all your needs for audio mastering and music production. Check the online documentation for this valuable software on Ardour homepage (http://www.ardour.org): if you are a musician, the patience needed to learn it's usage and hotkeys is definitely worth the effort.

Audacity is a user-friendly audio editing program suitable to manipulate your audio files, interviews and recordings, separating or mixing them, applying effects and encoding in various formats. It can also be used to record audio straight away via its intuitive interface, which can be commonly found also on other operating systems since it is a cross-platform free application. A perfect choice to start manipulating audio.

Rezound is a well capable sample editor that lets you manipulate with good precision your music samples, record, loop and apply effects using an intuitive and complete interface, quite responsive also on slower systems.

TimeMachine is a simple yet very useful tool for recording audio, requiring Jack as a sound engine. It is simply a big red button: when you press it it will start recording starting from 10 seconds ago, so that you can record what you find interesting in an audio input just while listening. Whenever you press it records what you just listened, without the need to rewind the tape.

Stream

MuSE is another rasta soft by dyne.org included, which lets you stream audio on the internet over various servers (Icecast, Darwin and Shoutcast) in MP3 or OGG format, so that listeners will be able to listen to your voice and music connecting with most available sound players around.

MuSE can mix up to 6 encoded audio bitstreams (from files or network, mp3 or ogg) plus a souncard input signal, the resulting stream can be played locally on the sound card and/or encoded at different bitrates, recorded to harddisk and/or streamed to the net.

A great introduction to streaming and how to operate muse is available online on http://flossmanuals.org/muse, while even more documentation can be found on its website (http://muse.dyne.org).

Chapter 5. Graphical software

Image manipulation and 3d modeling

The dyne:bolic distribution includes some eccellent programs for image composition and 3d modeling:

Gimp is a well mature application capable to create and edit bitmap images, offers a perfect environment for web graphics as well a powerful script engine to automatize its operations and even generate automatically stylish logos.

Inkscape is a vectorial graphics editor suitable for free hand drawing, cartoons and comics and more generally scalable graphics, realizing an ideal tool for flyers, high resolution prints and quadri-chromic prints

Blender consists of a powerful environment for 3d modeling and game development: it features a well designed interface, a ray tracing engine and scriptability of object behaviours in python: it can produce rendered scenes as well interactive applications and animations on timelines. There is allready a great comunity of artists using it, tutorial and examples are available on its website, as well a detailed manual that can be ordered online. Blender is one of the best tools in the open source and free software world for multimedia productions of many kinds, being adopted in the production of several professional movies. Using the clustering capability of dyne:bolic you can easily build render farms distributing the load on several computers on the same network, see the Spot's tutorial available online on http://.

GQview is an easy to use image browser which you can also use to build slideshows to interactively show your image galleries.

ImageMagick is a set of commandline tools, starting from the *convert* terminal command (see *man convert*) you can easily script batch operations over multiple files, applying format conversion and filters on large quantities of images.

Chapter 6. Text software

Text editing and publishing with dyne:bolic

Dyne:bolic includes software to let you easily write and compose any kind of text document: hyper-texts that can be published on the internet (HTML), formatted texts that can be printed (RTF, PDF, Postscript and even the deprecated DOC [1] format).

In case you need a full blown office suite to satisfy your needs here, there is an *Open Office 2.0* dyne module available online for download from our website, you can place it into your Dock modules directory (dyne/modules/) and at next reboot you'll find it in the application menu. With Open Office you can read and write all .DOC files, .XLS spreadsheets, .PPT presentations and more.

Scribus is a desktop publishing program to compose vectorial formats like PDF and Postscript, it is useful to paginate text in a professional printable form to produce magazines, flyers and most publications that need to mix text and images in pages following customizable schemes.

Lyx is a document editor whose backend is the powerful Tex environment, supporting various character sets and scientific symbols. Along Tex is also provided a complete setup of DocBook tools to process SGML files into the many formats supported

Nedit is a plain text editor providing syntax highlight for a couple of sourcecode languages, it is intuitive and easy to use for the newbies, but at the same can offer a powerful environment for programmers.

At last, *Antiword* is a very handy commandline application to convert with a simple command any .doc file into a plain text file, keeping the alignement of the lines intact. For a quick start try it out:

```
[d:b] ~ #antiword evil.doc > good.txt [Enter]
```

as usual there are manual pages providing more informations on its usage, just type *man antiword* into a terminal.

Notes

1. You shouldn't use the .DOC format for many reasons: it exposes all your previous changes in your documents which can often lead to a privacy problem, it can vehicle dangerous viruses that affect other proprietary systems and it stores your text in a non-readable way which ties you up to the availability of proprietary software. See the extensive document http://www.gnu.org/philosophy/no-word-attachments.html on the topic. However, dyne:bolic is able to read and write all .DOC files.

Chapter 7. Communication software

Communication software included in dyne:bolic

Since their birth, UNIX systems have been specially enhanced for network tasks, to efficiently handle communication protocols connecting computers across the net and of course the Internet. Being a GNU/Linux system, dyne:bolic offers a vast range of possibilities and applications, from the simpliest to the most advanced network software.

As a practical tool for media hacktivism, dyne:bolic emphasizes on protecting the privacy of the users, providing an anonymizing proxy and email encryption tools ready for use.

The *Samba* filesharing daemon runs by default on dyne:bolic, sharing in read-only the currently running system on the local network to make it available for network installing. If you want to share other directories you'll need to tweak by hand the configuration file in */etc/samba*

Surf the web

There are three different ways to access the WWW pages on the net using dyne:bolic, thanks to the variety of web browsers developed for the GNU/Linux platform.

The first and most familiar browser is *Firefox* which is developed by the Mozilla team in order to have a fully capable tool to access the web. Firefox offers an intuitive interface, bookmark handling and a couple of plugins that can be used to extend its functionalities.

Then we have *Links* which is a lightweight alternative to the previous: it runs much faster on old computers while still offering most of the crucial functionalities. It is remarkable its quality and speed in rendering web pages, making it a great tool for presentations.

In order to edit webpages, *Nvu* is provided for web designers, which provides a powerful WYSIWYG environment that is fully integrated with the Firefox/Mozilla standards of webpages. It is a user-friendly tool that you'll find available also for many other platforms and operating systems, so it's worth a little effort to learn how to use it, then you can have your homepage ready in minutes.

A powerful "spider" is also included to crawl and download entire websites: *WGet*, which is a commandline tool. As usual you can discover how it works by consulting its manual from an XTerminal, typing *man wget*.

For better privacy and anomymity when browsing, but also to weed out often annoying advertisements and popups, a proxy is running by default: *Tor* can be configured for use in each browser to make all internet connections completely anonymous and not traceable, see the starting web page of the graphical web browsers for details.

Email and encryption

Email is nowadays the most widespread technology used for personal communication on the net. Alltough it is often not secured for privacy and it is being easily intercepted by all kind of third parties: to enforce governmental control, market surveys and spionage. If you are concerned about privacy then you probably allready heard about the solution to secure email communication: *encryption*.

Encryption is a technique based on mathematical formulas, it can ensure security in your communication by using two keys: a private and a public one, you will give the public to your friends while keep the private one to decypher the messages you receive - everyone wanting to send you a secure message will need to use your public key to encrypt it and only your private key will be able to decrypt it. For more information on its usage and implementation refer to the web pages on http://www.gnupg.org

Dyne:bolic comes equipped with a popular email program: *Thunderbird* which can handle local downloading of mailbox, filters, folders and multiple accounts. It can be integrated with the *GnuPG encryption* system installing a plugin extension called *Enigmail*.

Also included is *GPA* the GNU Privacy Assistant which will help you in the task of generating your encryption keys and handling the collection of your friends keys into a local keyring.

Chapter 8. Development tools

Extend and customize the dyne liveCD

Dyne:II comes with an SDK to re-master a dyne liveCD including all your modifications and to package additional software collections. In fact, Dyne:II is a Dyne to produce Dyne. See it like a Nomad Distribution attached to no hardware. You carry your live cd/dvd/usb key loaded. you boot on it on any machine, you do your stuff (from a user AND/OR developer point of view), you create a new live cd, you remove all your traces and you leave the camp. Just walk around the world with your rewritable CD or usb-stick and that's it.

In the dyne developers lounge (http://dev.dynebolic.org) you'll find up to date documentation on how to create and publish new modules, repack a new CD and more in general to better understand the innards of dyne:II.

After all, this is a quite simple and minimalistic operating system (the underlying distribution philosophy can be referred to the Slackware one and more in general to the KISS principle), all scripted in shell, awk and sed from scratch. Function libraries along with auxiliary programs are all included in the /lib/dyne directory, where the code is fairly documented.

As you'll acknowledge from the online documentation, the *dynesdk* is present to facilitate all your dyne related development tasks, try 'dynesdk -h' for a brief help on functionalities.

Not specifically related to dyne:II development, in this new release the GNU C and C++ Compiler is included along with several scripting language and relative toolkit externals as Python, Perl, Tcl/Tk and Ruby. Also 3 different integrated development environments are included for visual programming: *Glade* working with GTK and C, *Fluid* working with Fltk and C++, *Gambas* (provided by the external devel module) for basic visual programming.

And don't forget the force :) of shell scripting, as there is also *gtkdialog* that you can use to quickly realize graphical dialogs and user interaction combining various components.

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