HOWTO Template for Big Linuxdoc HOWTOs

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HOWTO Template for Big Linuxdoc HOWTOs

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This is a fully working template for big HOWTOs. The source contains fully described slots to make a convenient framework for you to fill in for making your own HOWTO, suggesting some names, conventions and contents for the chapters.

1. Introduction

My comments to the reader is in this style (emphasized). Example lines are in plain roman style. *Note that extra comments and advice is found in comments within the SGML source.*

For various reasons this brand new release is codenamed the **release** release.

New code names will appear as per industry standard guidelines to emphasize the state-of-the-art-ness of this document.

This document was written when I read a feedback asking for a template to fill in to make new HOWTOs. This template is made by extracting the skeletal structure of the Multi Disk HOWTO which is a rather large HOWTO.

This Template is a suggestion and a starting point, a check list and examples for authors; it is not a requirement to be followed slavishly. Over time HOWTOs might also outgrow any template since in the end the goal is to inform readers efficiently.

Stating the background is a simple way to getting started writing the intro.

First of all we need a bit of legalese. Recent development shows it is quite important.

1.1 Copyright

Copyright is a source of much and continuous debate on the LDP mailing list. For more in depth information please consult the Manifesto at the LinuxDoc site. *The purpose of having a license is to allow appropriate distribution. You can use any license that meets the Manifesto. What follows is a boilerplate licence.*

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You are strongly recommended to take a backup of your system before major installation and backups at regular intervals.

1.3 News

This is where you make a summary of what is new. When a HOWTO exceeds 20 pages it takes more than a casual read to find the updates. This is where you help your readers with that, alerting them to specific and important news.

This is the second release featuring more samples and an improved structure.

Tell people where the document home page is so the very newest release could be found in case of problems with the main Linux Documentation Project homepage.

The latest version number of this document can be gleaned from my plan entry if you finger my Nyx account.

If you have the capacity it would be nice to make the HOWTO available in a number of formats.

Also, the latest version of the Template will be available on my web space on Nyx in a number of formats:

- HTML.
- plain ASCII text.
- SGML source.

Note that paper sizes vary in the world, A4 and US letter differ significantly.

1.4 Credits

It is always nice to acknowledge people who help you with inputs, it is also regarded by many as important in the Linux world new economy

In this version I have the pleasure of acknowledging

```
corff (at) ZEDAT.FU-Berlin.DE
dwood (at) plugged.net.au
lcl (at) spiretech.com
kgh12351 (at) nifty.ne.jp
dave (at) lafn.org
name (at) site.org
```

Scramble the addresses so email harvesters cannot get addresses from your HOWTO and then spam people. That has happened in the past.

1.5 Translations

Not everyone speaks English, pointers to translations are nice. Also your translators tend to give very important inputs.

- German Translation by someone (at) somewhere.de
- Swedish Translation by someone (at) somewhere.se
- French Translation by someone (at) somewhere.fr
- Chinese Translation by someone (at) somewhere.cn
- Italian Translation by someone (at) somewhere.it

Also Somecompany is acknowledged for sending me documentation on their gizmos as well as permission to quote from the material. These quotes have been approved before appearing here and will be clearly labelled.

Any comments or suggestions can be mailed to my mail address on Nyx: sgjoen@nyx.net.

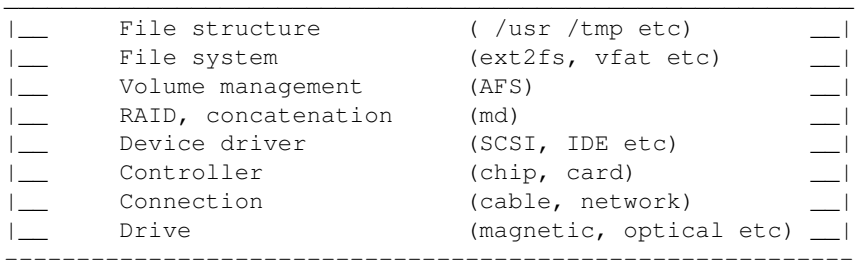
2. Structure

A quick overview on how all parts fit together in the structure. Here I use an example from my Multi Disk HOWTO.

As this type of document is supposed to be as much for learning as a technical reference document I have rearranged the structure to this end. For the designer of a system it is more useful to have the information presented in terms of the goals of this exercise than from the point of view of the logical layer structure of the devices themselves. Nevertheless this document would not be complete without such a layer structure the computer field is so full of, so I will include it here as an introduction to how it works.

2.1 Logical structure

This is based on how each layer access each other, traditionally with the application on top and the physical layer on the bottom. It is quite useful to show the interrelationship between each of the layers used in controlling drives.



In the above diagram both volume management and RAID and concatenation are optional layers. The 3 lower layers are in hardware. All parts are discussed at length later on in this document.

2.2 Document structure

Most users start out with a given set of hardware and some plans on what they wish to achieve and how big the system should be. This is the point of view I will adopt in this document in presenting the material, starting out with hardware, continuing with design constraints before detailing the design strategy that I have found to work well. I have used this both for my own personal computer at home, a multi purpose server at work and found it worked quite well. In addition my Japanese co-worker in this project have applied the same strategy on a server in an academic setting with similar success.

Finally at the end I have detailed some configuration tables for use in your own design. If you have any comments regarding this or notes from your own design work I would like to hear from you so this document can be upgraded.

2.3 Reading plan

As you go beyond 50 pages or so there will be a lot of text that experts and even the experienced do not need to read. Keeping in mind that we wish to care for all kinds of people in the Linux world we might have to make a reading plan. Again example follows from my HOWTO.

Although not the biggest HOWTO it is nevertheless rather big already and I have been requested to make a reading plan to make it possible to cut down on the volume

Expert
: (aka the elite). If you are familiar with Linux as well as disk drive technologies you will find most of what you need in the appendices. Additionally you are recommended to read the FAQ and the Bits'n'pieces chapter.

Experienced
: (aka Competent). If you are familiar with computers in general you can go straight to the chapters on technologies and continue from there on.

Newbie
: (mostly harmless). You just have to read the whole thing. Sorry. In addition you are also recommended to read all the other disk related HOWTOs.

3. Technologies

Introduction of technology for the newbie with a few references to detailled works. Remember that not everyone has Internet access so you have to explain in sufficient details so even the newbie can get by.

4. Implementation

Now your readers should have a sufficient knowledge of what this is about and now we come to the hands on of implementing your clever scheme.

5. Maintenance

Few systems and designs are maintenance free, here you explain how to keep the system running.

6. Advanced Issues

You can get most things up and running in a quick and dirty fashion, useful for testing and getting used to how things work. For more serious use you would need to be a little more advanced. This is the place to explain it all, if applicable.

7. Troubleshooting

Many problems can be solved by a simple structured approach, analysing the symptoms, finding the cause and determining the solution. The following is an excerpts from the Multi Disk HOWTO.

7.1 During Installation

Locating Disks

Symptoms
: Cannot find disk

Problem
: How to find what drive letter corresponds to what disk/partition

Solution
: Remember Linux does not use drive letters but device names. More information can be found in section "Drive names".

Symptoms
: Cannot partition disk

Problem
: Most likely wrong input to the command line for `fdisk` or similar tool.

Solution
: Remember to use `/dev/hda` rather than just `hda`. Also do not use numbers behind `hda`, those indicate partitions.

Formatting

Symptoms
: Cannot format disk.

Problem
: Strictly speaking you format partitions not disks.

Solution
: Make sure you add the partition number after the device name of the disk, for instance `/dev/hda1` to the command line.

8. Further Information

A HOWTO cannot describe everything, some times the user has to venture out on the net to get more information or just updates. Here is the place to tell where and how. Again examples from my HOWTO, replace as needed. There is wealth of information one should go through when setting up a major system, for instance for a news or general Internet service provider. The FAQs in the following groups are useful:

8.1 News groups

Some of the most interesting news groups are:

- Storage.
- PC storage.
- AFS.
- SCSI.
- Linux setup.

Most newsgroups have their own FAQ that are designed to answer most of your questions, as the name Frequently Asked Questions indicate. Fresh versions should be posted regularly to the relevant newsgroups. If you cannot find it in your news spool you could go directly to the FAQ main archive FTP site. The WWW versions can be browsed at FAQ main archive WWW site.

Some FAQs have their own home site, of particular interest here are

- SCSI FAQ and
- comp.arch.storage FAQ.

8.2 Mailing Lists

These are low noise channels mainly for developers. Think twice before asking questions there as noise delays the development. Some relevant lists are `linux-raid`, `linux-scsi` and `linux-ext2fs`. Many of the most useful mailing lists run on the `vger.rutgers.edu` server but this is notoriously overloaded, so try to find a mirror. There are some lists mirrored at The Redhat Home Page. Many lists are also accessible at linuxhq, and the rest of the web site is a gold mine of useful information.

If you want to find out more about the lists available you can send a message with the line `lists` to the list server at vger.rutgers.edu (majordomo@vger.rutgers.edu). If you need help on how to use the mail server just send the line `help` to the same address. Due to the popularity of this server it is likely it takes a bit to time before you get a reply or even get messages after you send a `subscribe` command.

There is also a number of other majordomo list servers that can be of interest such as the EATA driver list (linux-eata@mail.uni-mainz.de) and the Intelligent IO list linux-i2o@dpt.com.

Mailing lists are in a state of flux but you can find links to a number of interesting lists from the Linux Documentation Homepage.

8.3 HOWTO

These are intended as the primary starting points to get the background information as well as show you how to solve a specific problem. Some relevant HOWTOs are `Bootdisk`, `Installation`, `SCSI` and `UMSDOS`. The main site for these is the LDP archive at Metalab (formerly known as Sunsite).

There is a new HOWTO out that deals with setting up a DPT RAID system, check out the DPT RAID HOWTO homepage.

8.4 Mini-HOWTO

These are the smaller free text relatives to the HOWTOs. Some relevant mini-HOWTOs are `Backup-With-MSDOS`, `Diskless`, `LILO`, `Large Disk`, `Linux+DOS+Win95+OS2`, `Linux+OS2+DOS`, `Linux+Win95`, `NFS-Root`, `Win95+Win+Linux`, `ZIP Drive` . You can find these at the same place as the HOWTOs, usually in a sub directory called `mini`. Note that these are scheduled to be converted into SGML and become proper HOWTOs in the near future.

The old `Linux Large IDE mini-HOWTO` is no longer valid, instead read `/usr/src/linux/drivers/block/README.ide` or `/usr/src/linux/Documentation/ide.txt`.

8.5 Local Resources

In most distributions of Linux there is a document directory installed, have a look in the /usr/doc directory. where most packages store their main documentation and README files etc. Also you will here find the HOWTO archive (/usr/doc/HOWTO) of ready formatted HOWTOs and also the mini-HOWTO archive (/usr/doc/HOWTO/mini) of plain text documents.

Many of the configuration files mentioned earlier can be found in the /etc directory. In particular you will want to work with the /etc/fstab file that sets up the mounting of partitions and possibly also /etc/mdtab file that is used for the `md` system to set up RAID.

The kernel source in /usr/src/linux is, of course, the ultimate documentation. In other words, *use the source, Luke*. It should also be pointed out that the kernel comes not only with source code which is even commented (well, partially at least) but also an informative documentation directory. If you are about to ask any questions about the kernel you should read this first, it will save you and many others a lot of time and possibly embarrassment.

Also have a look in your system log file (/var/log/messages) to see what is going on and in particular how the booting went if too much scrolled off your screen. Using `tail -f /var/log/messages` in a separate window or screen will give you a continuous update of what is going on in your system.

You can also take advantage of the /proc file system that is a window into the inner workings of your system. Use `cat` rather than `more` to view the files as they are reported as being zero length. Reports are that `less` works well here.

8.6 Web Pages

There is a huge number of informative web pages out there and by their very nature they change quickly so don't be too surprised if these links become quickly outdated.

A good starting point is of course the Linux Documentation Project home page, an information central for documentation, project pages and much, much more.

Please let me know if you have any other leads that can be of interest.

9. Getting Help

Your reader might still end up in a situation where extra help is needed from someone else, perhaps on the net. In order to get fast and efficient help it is best first to get some details on your system. What details matter depends on type of problem. For disk problems you need to know the disk controllers etc, for networking problems you have to know what ethernet card is used and version of drivers etc. Here is the place to suggest what details to have ready when asking for help.

In the end you might find yourself unable to solve your problems and need help from someone else. The most efficient way is either to ask someone local or in your nearest Linux user group, search the web for the nearest one.

Another possibility is to ask on Usenet News in one of the many, many newsgroups available. The problem is that these have such a high volume and noise (called low signal-to-noise ratio) that your question can easily fall through unanswered.

No matter where you ask it is important to ask well or you will not be taken seriously. Saying just *my disk does not work* is not going to help you and instead the noise level is increased even further and if you are lucky someone will ask you to clarify.

Instead describe your problems in some detail that will enable people to help you. The problem could lie somewhere you did not expect. Therefore you are advised to list up the following information on your system:

Hardware

- ◊ Processor
- ◊ DMA
- ◊ IRQ
- ◊ Chip set (LX, BX etc)
- ◊ Bus (ISA, VESA, PCI etc)
- ◊ Expansion cards used (Disk controllers, video, IO etc)

Software

- ◊ BIOS (On motherboard and possibly SCSI host adapters)
- ◊ LILO, if used
- ◊ Linux kernel version as well as possible modifications and patches
- ◊ Kernel parameters, if any
- ◊ Software that shows the error (with version number or date)

Peripherals

- ◊ Type of disk drives with manufacturer name, version and type
- ◊ Other relevant peripherals connected to the same busses

Remember that booting text is logged to `/var/log/messages` which can answer most of the questions above. Obviously if the drives fail you might not be able to get the log saved to disk but you can at least scroll back up the screen using the `SHIFT` and `PAGE UP` keys. It may also be useful to include part of this in your request for help but do not go overboard, keep it *brief* as a complete log file dumped to Usenet News is more than a little annoying.

10. Concluding Remarks

Just summing up... Also a place for general recommendations.

11. Questions and Answers

Check the newsgroups and try to determine some frequent problems and cover them here. Again an example from my HOWTO.

This is just a collection of what I believe are the most common questions people might have. Give me more feedback and I will turn this section into a proper FAQ.

- Q:How many physical disk drives (spindles) does a Linux system need?

  A: Linux can run just fine on one drive (spindle). Having enough RAM (around 32 MB, and up to 64 MB) to support swapping is a better price/performance choice than getting a second disk. (E)IDE disk is usually cheaper (but a little slower) than SCSI.
- Q: Are there any disadvantages in this scheme?

  A: There is only a minor snag: if even a single partition overflows the system might stop working properly. The severity depends of course on what partition is affected. Still this is not hard to monitor, the command `df` gives you a good overview of the situation. Also check the swap partition(s) using `free` to make sure you are not about to run out of virtual memory.
- Q: OK, so should I split the system into as many partitions as possible for a single drive?

  A: No, there are several disadvantages to that. First of all maintenance becomes needlessly complex and you gain very little in this. In fact if your partitions are too big you will seek across larger areas than needed. This is a balance and dependent on the number of physical drives you have.

(rest deleted.)

12. Bits and Pieces

This is basically a section where I stuff all the bits I have not yet decided where should go, yet that I feel is worth knowing about. It is a kind of transient area.

13. Examples

Example designs and sample configuration files and other relevant details is always handy. Keep large samples at the end to avoid breaking the flow of the HOWTO reading. Small samples are useful within the main body of the HOWTO.

14. Samples

This section gives some simple SGML examples you could copy. Read the source to see how it was done.

14.1 Lists

Lists appears many times, in a number of formats:

Unlisted bullets:

- Apples
- Oranges
- Bananas

Tagged lists

Fruits
: such as apples, oranges, and more.

Nuts
: Don't eat too many; you are what you eat.

Vegetables
: Potatos are spelled with care.

14.2 Links

Links can be used within your documents to refer to different sections and chapters or to refer to documents external to yours.

Internal links

Click on this link to jump to the top of this chapter. Note the anchor at the section tag.

External links

Click on this link to jump to the LDP site. Note you can use http, ftp, news and other protocols in the locator if required. Note that the character ~ has to be escaped, see the source for details.

14.3 Images

Avoid diagrams if possible as this cannot be rendered in the ascii outputs which are still needed by many around the world.

Graphics Test Image

15. Table Samples

This section gives an example of writing a table.

Line No.	Country	Capital
1	Norway	Oslo

2	Japan	Tokyo
3	Finland	Helsinki

Some capitals

16. Notes on Style

Not much here yet but I would like to suggest a few points.

Tags
: Try to use tags extensively

Types
: Try using functional tags such as em rather than it.

Files
: Try using functional links to files such as `/usr/doc` rather than just /usr/doc.

Commands
: Try to refer to man pages including section number `df (1)` rather than just df.

17. Converting the SGML File

Having made the SGML file we are now ready to convert it to the various output formats we need. The following is my script to process my Multi Disk HOWTO:

```
sgml2txt -f disk.sgml
sgml2html disk.sgml

sgml2latex --papersize=a4 --language=english  --output=ps ~stein/doc/disk.sgml
mv disk.ps disk-A4.ps
gzip -9 disk-A4.ps

sgml2latex --papersize=letter --language=english  --output=ps ~stein/doc/disk.sgml
mv disk.ps disk-US.ps
gzip -9 disk-US.ps
```

The template can be converted as is, substitute "disk.sgml" with the filename of this template to see what it looks like.

If your document is small (such as this template) you might find it more convenient to keep formatted versions in one single file rather than splitting it for every chapter:

```
sgml2html --split=0 template.sgml
```

18. Appendix A: Copyright

of this license document, but changing it is not allowed.

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