Project no. IST-033576

XtreemOS

Integrated Project
BUILDING AND PROMOTING A LINUX-BASED OPERATING SYSTEM TO SUPPORT VIRTUAL
ORGANIZATIONS FOR NEXT GENERATION GRIDS

Public LiveCD release - XtreemOS 2.0
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0.1	11/18/09	Antoine Giniès	EDGE	updated document

Contents

1 Introduction

This document presents what will be the future XtreemOS LiveCD Linux distribution based on the XtreemOS 2.0 release. It explains what types of liveCDs are possible and outlines the requirements for creating a live CD.

The live CD should contain the XtreemOS 2.0 components, be unique and ideally will provide the ability to run some XtreemOS services on a computer without a hard drive.

No liveCD has been released yet. This document is only a presentation of prerequisites and testing already completed with the goal of releasing a fully functional LiveCD. In the previous release of XtreemOS 1.0 some liveCDs were built, but only for testing purposes and experimentation. It has not been yet decided to release one with the final XtreemOS release next year. However, working on a prototype LiveCD is a helpful to understand all XtreemOS services and its implementation.

2 Requirements

To create a live CD, some basics are required. This chapter outlines all the requirements to be able to create the liveCD.

2.1 Stable 2.0 Release

A LiveCD is read-only and can not be modified. This is a large constraint as you cannot change installed packaged and configuration after it is released. Thus the first need is to base the CD image on the latest stable release with included updates, as our aim is to make the CD simple to use, yet there is no possibility to provide updates to unknown bugs or issues. To create the LiveCD we use the 2.0 release with all package updates included to ensure that there is no known bugs or incorrect interaction between XtreemOS components.

2.2 Use Cases for a LiveCD

One of the primary uses of a live CD is for demonstration purposes for end users who may not be able to access a large scale test bed or for example at demonstrating XtreemOS at a trade show booth. Even so, it can be used for other use cases. For example, it can be used to provide an easy installation of XtreemOS release without using the installation process provided by the XtreemOS Installation CD. The liveCD will boot on RAM and immediately be usable, but with an easy use optional hard drive install. Another use case for a liveCD is for testing new versions of XtreemOS components. While XtreemOS provides up to date repositories, before releasing a new XtreemOS version, systematic testing with a liveCD can be useful for this task. Another use of the liveCD is to pre-configure the computer to provide a subset of services through a wizard.

2.3 The Draklive tool

As explained in Mandriva's wiki page, Draklive is a ISO mastering tool that builds a live distribution according to a configuration file, creates a master image and optionally installs it on a device. It is the tool used and maintained by the Mandriva team to build the distribution. Draklive's philosophy is to keep the live distribution as close as possible to the normal Linux distribution. All specific live tweaks are done in a very tiny initrd script. Since this initrd is generated on the fly, it is very small and is simpler to debug. Using Draklive provides an easy way to create a XtreemOS liveCD based on the XtreemOS 2.0 release.

3 Build A LiveCD

To Build a LiveCD we need to add some pre-requires in the XtreemOS 2.0 release. First, we will use an *unionfs* patch, which allows a transparent filesystem overlay and enables file removal, as needed. The recommended kernel is the official 2.6.27.24 XtreemOS Linux kernel with one more patch. Second, we have to modify the Window manager environment of the *guest* user in able to create a functional liveCD.

Hardware detection will be done with harddrake at boot time. Harddrake provides a reliable integration of a very broad range of hardware without a permanent installation process.

Our draklive tool is heavily based on the Mandriva's official one. To get drakelive and all the needed configuration files, you can download them via the gforge subversion repository:

```
$ svn+ssh://scm.gforge.inria.fr/svn/xtreemos/distribution/
>build-xos-distribution/livecd_2009
```

3.1 Configuration

Draklive uses only three configuration files as describe below. The *setting.cfg* files describes the main options of the liveCD (repositories, name etc...). The *live.cfg* which includes the steps to create the image. The last one is the *auto_inst.cfg.pl* file used to describe the auto installation process mode of the liveCD.

3.1.1 setting.cfg

The main options of the liveCD are defined in the *config/settings.cfg* file.

```
repository=/home/xtreemos/build_bcd/build/XtreemOS-2.0-i586
updates_repository=
additional_repository=http://192.168.100.8/dis/official/2009.0
arch=i586
desktop=IceWM
media=cdrom
region=int
pack=
name=XtreemOS
product=one
version=2.0
commercial=0
default_user=guest
```

1. **repository** : the path to the installer repository

2. **additional_repository** : this option is no more used, because liveCD is now based on an XtreemOS 2.0 release

3. **arch** : liveCD will be only based on i586 arch

4. **desktop** : the default desktop will be IceWM

5. **media** : there is an option to be able to build an USB key or a liveCD

6. **region** : select languages (here international)

7. **name** : the name of the LiveCD

8. **commercial** : this option is used to define whether we want to include proprietary software

9. **default_user** : *guest* will be the default user

3.1.2 live.cfg

the live.cfg reads the *config/setting.cfg* basic configuration (arch, repositery etc...). Then there are several sections to define languages, files, module options, packages to install, etc...

- **langs_always** : default selected language

- **files** : this section is used to add more files which are not present on a package or in the installed system, very usefull to do customisation

- **remove_files** : liveCD is limited to 700MB, so we need to remove files from the Live-CD chroot

- **module_options** : some modules need parameters, this the place to add them

- **exclude_modules** : list of modules to exclude from the initrd image

- **additional_modules** : list of modules you want to add in the initrd

- **patches** : LiveCD content is based on the XtreemOS2.0 release, in some cases we need to patch some files in the chroot

- **erase_rpms** : list of pacakges to remove from the chroot

- **disable_services** : list of services to disable on the LiveCD

- **initrd_post** : initrd creation has some options, use this section to choose them

- **regions** : which languages will be available on the LiveCD

3.1.3 auto_inst.cfg.pl

The automated installation feature of DrakX is controlled by the contents of the file named *auto_inst.cfg.pl*. The contents of the auto_inst.cfg file are comprised of a Perl Scalar Structure declaration (o). The declaration $o = ...; is used by the DrakX program to preset various options and selections. Within the opening/closing braces are a series of simple and/or compound declarations (representing your selections).

- **media**: this option will define the media which contains the RPMS. In our case there is only one media, the XtreemOS one

- **rpmsrate_flags_chosen**: choose which weight (1 to 5) for each categories of packages should be selected

- **skipped_packages**: which package should not be installed, in our case all packages are related to XtreemOS, so we should install all of them

- **default_packages**: which packages will be installed

- **users**: add a specific user to your system, guest user will be the default one

- **locale**: this option allows you to select the locale used for text presentations. The default is English US (en_US).

- **keyboard**: specify the type of keyboard you are using by specifying one of the country codes.

- **timezone**: set the Time zone for the computer and to indicate if the computers hardware clock is set to UTC (GMT) or not

- **excludedocs**: exclude or include the package documentation, include docs will take place on the liveCD, so it is a good idea to remove all documnetation

- **postInstall**: simple method to perform action at the end of the installation

- **autoExitInstall**: automatically exit the installation process

- **keep_unrequested_dependencies**: keep package without any dependencies

3.2   patch

3.2.1   finish-install.xsetup

GDM is the login manager used under XtreemOS 2.0. This patch fixes a problem of restarting the GDM greeter.

3.3   files

I this directory draklive stores all default configuration files binairies and documentation you wish to include on the liveCD. For example, we can provide a default configuration file for LinuxSSI, or some binary to test checkpointing or to enable certain XtreemOS services. If you want to probe more modules at liveCD boot, just add them into *mandriva-live.modprobe.cdrom* file.

3.4   Making the Live-CD

Draklive command takes various arguments. Just run *draklive –help* to see all of them.

Most important ones are:

- **–clean** : clean installation chroot and work directory

- **–all** : run all steps, from installation to mastering

- **–config** : makes draklive use the next argument as a configuration file. This file should contain a hash describing the live distribution, meaning the system (chroot and boot), media (usb, cdrom, nfs) and mount type (simple R/W union, union with squash files).

To clean the old Live-CD build, run draklive with the **–clean** argument. Once done draklive will show the path where the ISO is stored.

4 Content of the LiveCD

The liveCD will be based on the XtreemOS 2.0 release with all updates at the time of release. A graphical tool needs to be created to enable selecting the type of installation and automatically disable or enable the services during boot time.The user will then be asked some configuration parameters, before being able to join or create an XtreemOS Virtual Organization.

5 Conclusion

Producing a liveCD could be a good idea to be able to run some tests on boxes without installing everything. Scenarios have to be designed to easily integrate a node into an XtreemOS cloud. The main drawback of creating a liveCD is the need for a strong QA process to validate all scenarios and we also need to be sure that the user's environement is suitable.

6 References

Draklive official website:

```
http://wiki.mandriva.com/en/Draklive
```

Subversion repository of draklive:

```
http://svn.mandriva.com/svn/soft/draklive/trunk
```

General information about liveCD:

```
http://en.wikipedia.org/wiki/Livecd
```