

---

## Porting T<sub>E</sub>X Live to OpenBSD

Edward Barrett

### Abstract

The history, creation, and fruition of porting T<sub>E</sub>X Live to OpenBSD.

### 1 Why T<sub>E</sub>X?

At the time that I became a student, I had been using \*NIX systems for years, in particular an operating system called OpenBSD, which is one of the BSD<sup>1</sup> derived open-source Unix-a-likes. OpenBSD aims to be “Free, Functional and Secure”, but it also has other qualities which made it appealing to me: it was small, it did not demand a fast computer and is developed with “correctness” in mind.

The existing WYSIWYG<sup>2</sup> document preparation software packages for OpenBSD either did not suit the nature of the document, or did not feel natural to me as a computing student. In particular:

- Most of my assignments required source code listings. Standard procedure generally consisted of copy and pasting large chunks of code into a word processor (screen by screen if you were in a terminal application). It did work, but it was tedious to repeat when the sources changed.
- During my two years in industry, Vim<sup>3</sup> had become second nature to me when editing text. In comparison a word processor seemed very limited and inefficient.

It was only when I saw what some of the members of staff at University had done with T<sub>E</sub>X that I became fully aware of its purpose. The concept of logical markup in a document felt right, and my previous gripes with word processors could be solved, not to mention that documents typeset with T<sub>E</sub>X looked a much more professional than anything I could make with a word processor. I started learning how to make documents like this myself using the existing teT<sub>E</sub>X package on my OpenBSD systems.

### 2 The retirement of the teT<sub>E</sub>X distribution

Oddly enough, the porting process of T<sub>E</sub>X Live started with the simple need for the rcs package in a document. I had one day decided that a verbatim CVS tag in the preface of my documents looked ugly and that I should find a solution.

A CTAN search revealed the rcs package, but it was not included in teT<sub>E</sub>X. I visited the teT<sub>E</sub>X web page to see if there was a possibility of including it in

future versions. It was then that I realized that teT<sub>E</sub>X development had sadly been retired for almost a year. The web page suggested that I pursue a project called “T<sub>E</sub>X Live”, so I did. I was mostly pleased with what I saw, but found the ISO disk image distribution format inconvenient, and the DVD only supplied i386 binaries for OpenBSD, which needless to say would not work on my Sun Sparc systems.

This was when I started the porting process, after an email to the `ports@openbsd.org` mailing list in March 2007 to see if anyone else had been working on a port. At the time I remember thinking that this was a week’s work at most. How wrong I was ...

### 3 Porting

My initial build confirmed that T<sub>E</sub>X Live was quite happy to build on OpenBSD. Now I had to integrate the build with the OpenBSD “ports” build system. The “ports” build system is basically a set of instructions (in the form of Makefiles) for building third party software, whose concept was originally devised by the FreeBSD project. NetBSD also has a similar system, as does the Gentoo Linux project. The advantage of these systems is that packages need not be manually built upon each new release of the operating system, as it can be powerfully automated.

Getting T<sub>E</sub>X Live to play nice with the ports infrastructure was not easy. A lot of the T<sub>E</sub>X Live build system did not honour the GNU standard `DESTDIR` environment variable, which is required to fool software into installing into a fake root filesystem ready for packaging. Luckily a tool called `systrace` allowed me to detect these bugs and I was able to “patch them away” before the build commenced. I applied just under 40 patches to the T<sub>E</sub>X Live build system, resulting in a package named `texlive_base-2007`. Following the conventions of the existing teT<sub>E</sub>X port, I made the `texmf` tree a separate package named `texlive_texmf-2007`.

On May 8<sup>th</sup> 2007 I posted my hopefully “completed” work onto the porting mailing list and waited.

Responses to my work were positive, but there was concern with the size of the `texmf` package which had exceeded 512 MB. I was asked to “trim it down”, if at all possible. The next few months proved to be the most difficult stage of the port, not only because I was studying for exams *as well as* porting, but also because I had uncovered some nasty bus errors in X<sub>Y</sub>T<sub>E</sub>X when run on the sparc64 CPU architecture. I think my housemates must have thought I was chasing a lost cause, but I was not prepared to give up.

<sup>1</sup> Berkeley Software Distribution

<sup>2</sup> What you see is what you get

<sup>3</sup> Vi Improved, <http://www.vim.org>

I decided to first concentrate on splitting the *texmf* tree. This involved learning how the (now deprecated) “TPM”<sup>4</sup> hierarchy worked as well as the various configuration files, so that they matched the relevant *texmf* subset that was installed. Norbert Preining had done a similar task for Debian Linux and generously shared what he knew. Also, a lecturer at University, Peter Knaggs, who had been using T<sub>E</sub>X for a while was able to explain some of the mechanisms of a T<sub>E</sub>X system. A Python script I called *MFSplit* sprang into existence. This creation split the large *texmf* tree into three smaller counterparts (minimal, full and documentation) and helped to generate configuration files. I must admit I found this quite challenging, even frustrating at times, and the T<sub>E</sub>X Live mailing list was a invaluable resource during times of confusion.

A major cause of the aforementioned frustration was due to the slowness of my dated Sun hardware. In an attempt to find something more practical, I placed a banner on my web page asking for hardware donations. I had expected to hear nothing. Within a few days one individual donated some money for a beer, which pleasantly shocked me, but not as much as when a company contacted me saying that they wished to donate a machine to the port! The company was *yellowshift LLC*, a consultancy company in America that believed in giving back to open source (<https://www.yellowshift.com/giving-back>). Gratefully I accepted and now I am a proud owner of a Sun Blade 1000 for development of T<sub>E</sub>X Live/OpenBSD for sparc64 systems.

As for the X<sub>Y</sub>T<sub>E</sub>X issues, the X<sub>Y</sub>T<sub>E</sub>X author and a very dedicated member of the T<sub>E</sub>X community, Jonathan Kew, helped me out greatly. It proved very difficult to debug over email, so I ended up granting him remote access to my build box in order for him to look more closely at the problem. Very quickly he put together some patches which fixed the issue (and a few others too), which were committed upstream and to the port.

#### 4 Integrating T<sub>E</sub>X Live into OpenBSD

On July 17<sup>th</sup> 2007 the T<sub>E</sub>X Live port was committed on my behalf to the head branch of the ports tree, but not yet linked to the build as a replacement for teT<sub>E</sub>X, since further community testing was needed. Small bug fixes and cleanups were applied. Eventually, on October 11<sup>th</sup> 2007, T<sub>E</sub>X Live replaced teT<sub>E</sub>X entirely for OpenBSD developer snapshots, and will certainly be included in upcoming OpenBSD-4.3. I consider this is a great personal achievement, as I

had always wished I could give something back to the open source community. I have been in contact with several developers interested in developing ports of T<sub>E</sub>X Live for their operating systems, including a developer from the Macports project who succeeded in translating the OpenBSD port to their ports system. I certainly do enjoy the freedom of open source software development.

If you are running the developer branch of OpenBSD (or *-current* as it is known), then you can get T<sub>E</sub>X Live now from the OpenBSD FTP servers. OpenBSD 4.3 pre-orders are available now; this is a great way to help the project.

#### 5 Thanks

I would like to take the opportunity to thank all of the people who have answered my questions on mailing lists, donated resources, helped me bug-fix or otherwise contributed to porting T<sub>E</sub>X Live to OpenBSD. It is greatly appreciated and I hope to meet some of you at the conference in Cork.

#### 6 About the author

Allow me to introduce myself, as I am new to the T<sub>E</sub>X community. I am a student at Bournemouth University in England. As far as I can remember, I have always been fascinated by computers, starting with the Sinclair Spectrum 48K. After messing about on computers most of my childhood (and advancing through almost all of the Sinclair Spectrum models), I studied computing at college and entered the *real* world as a programmer for a kitchen manufacture company. During this time I learned a web scripting language inside out, programmed some really interesting industrial machinery and pulled out a lot of hair trying to interpret 20-year-old BASIC code. Having done this for two years, I felt a change was in order and enrolled for a BSc computing degree. At the time of writing I am on the 3<sup>rd</sup> year of the degree, which is a “sandwich year” in which students work in industry for a year before returning to University to complete the final year. It turned out that I really liked the academic environment and wished to look into the possibility of an academic future. After enquiring if the University accepted placement students, I became a Unix systems administrator for the school of design, engineering and computing.

◇ Edward Barrett  
 eddbarrett (at) gmail dot com  
<http://students.dec.bournemouth.ac.uk/ebarrett>

<sup>4</sup> T<sub>E</sub>X Package Manager