INSTANT PREVIEW AND THE TEX DAEMON

TUG 2001

Delaware

EuroTEX2001

Kerkrade

Jonathan Fine

Cambridge, UK

jfine@activetex.org

INTERACTIVE TEX

Why can't TEX be used as the formatting engine of . . .

- a word processor
- a web browser
- a help system

Static `dvi` files will not do because a window may have

- variable content
- variable dimensions

We have to be able to regenerate the `dvi` file upon demand.

SPEED

An interactive program should respond to the user within 0.1 seconds.

Some timing tests, 225MHz Cyrix CPU.

- `tex \\end` $\rightarrow$ .240 sec
- `tex story \\end` $\rightarrow$ .245 sec
- `story` $\rightarrow$ $.245 - .240 = .005$ sec

If we can avoid the startup costs, TEX is easily quick enough.

If we can't, then we need gigahertz machines.

Many people cannot afford gigahertz desktops.

Most people cannot afford gigahertz laptops.

No-one can afford a gigahertz palmtop.

`ipctex` & `dvichop`

`ipctex` is standard TEX, except that it does not buffer the output `dvi` file. Created from usual web2c distribution, but

```
./configure --enable-ipc
```

`dvichop` breaks one long `dvi` file into sequence of small `dvi` files.

Input to `dvichop` of

```
markerpage[begin,n]
<pages>
markerpage[end,m]
```

writes <pages> to `n.dvi`, and sends signal (message) to process `m`.

`ipctex` and `dvichop` allow us to avoid the startup costs.

LICENSE & AVAILABILITY

The software described in this talk is available at `www.activetex.org`

It is released under the General Public License.

It was developed under GNU/Linux.

It consists of about 2,000 lines of code, which took about 3 months to write.

It was released on 27 May 2001.

Porting to UNIX should be easy.

Win32 and Mac OS-X should be easy for an expert.

The software will work with most or all TEX macro packages.

The software will work with e-TEX and Omega.

INSTANT PREVIEW

We will now have a live demo of Instant Preview.

HOW IT WORKS

1. We start `dvichop`. Input from `<dvipipe>`.

2. We start `ipctex`. Output to `<dvipipe>`.

3. TEX macros repeatedly input `<texpipe>`.

4. Start Emacs and enable minor mode Preview.

5. This starts xdvi, previewing `<pid>.dvi`

and now we repeat the following steps

6. Each change writes buffer to `<texpipe>`.

7. TEX writes typeset pages to `<dvipipe>`.

8. `dvichop` copies pages to `<pid>.dvi`.

9. `dvichop` sends signal to xdvi.

10. xdvi reloads the file `<pid>.dvi`.

TeX MACROS & INSTANT PREVIEW (IP)

All this places new demands on TeX macros.

- Error recovery (IP uses `\scrollmode`)
- Preserve TeX's state (e.g. `\maketitle`)
- Location in document (e.g. `\section`)

Suggest that Instant Preview be used for

- TeX and LaTeX training
- Tuning documents
- Tuning style parameters
- Writing memos and letters
- Showcasing TeX and its macros

TeX DAEMON & `tex()` FUNCTION

Traditionally, TeX is run as a batch program.

Instant Preview uses TeX as a daemon. (Such are called a service in Win32).

With further work

- sockets
- TeX macros
- input filter

TeX becomes a robust callable function `tex()`.

`tex()` could then be the formatting engine for

- a word processor
- a web browser
- a help system
- an email reader
- and many other applications

END