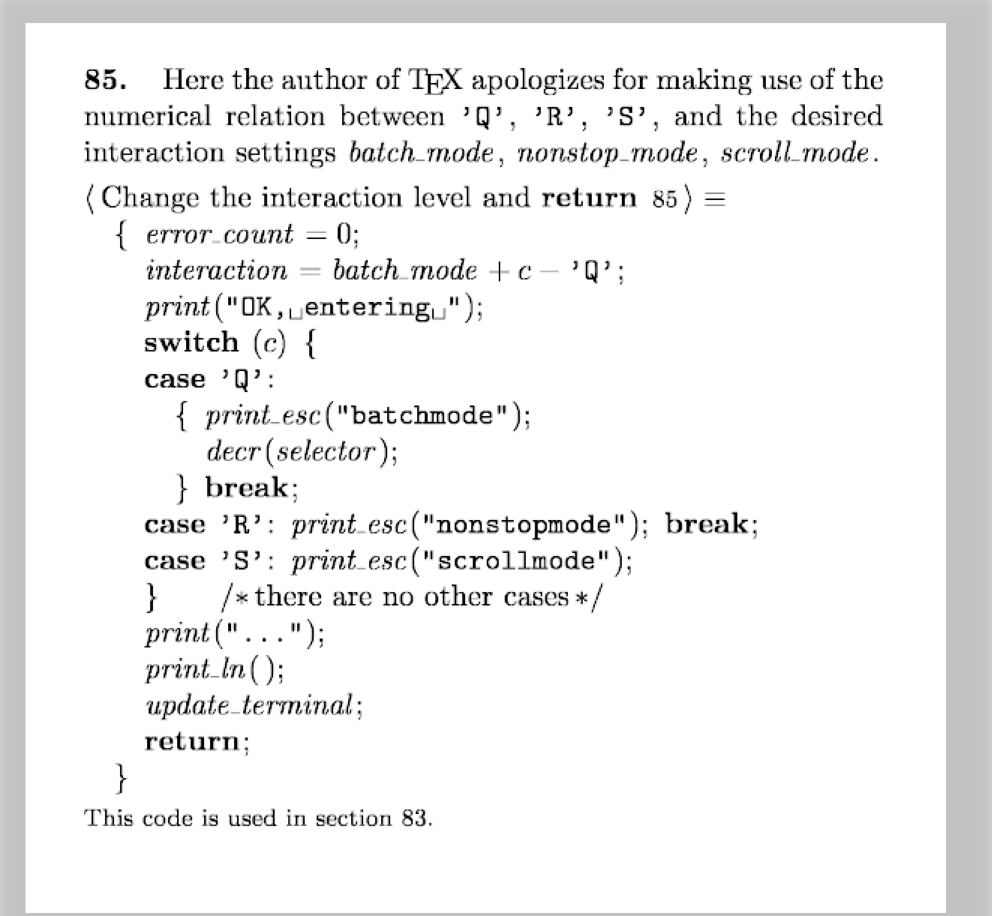
Hochschule
München
University of
Applied Sciences

Fakultät für Informatik und
Mathematk

cweb Source Code for TEX

Why, How, and What

Martin Ruckert, August 2021



85. Here the author of TEX apologizes for making use of the numerical relation between 'Q', 'R', 'S', and the desired interaction settings *batch_mode*, *nonstop_mode*, *scroll_mode*.

```
⟨ Change the interaction level and return 85 ⟩ ≡
  { error_count = 0;
    interaction = batch_mode + c − 'Q';
    print("OK,␣entering␣");
    switch (c) {
    case 'Q':
      { print_esc("batchmode");
        decr(selector);
      } break;
    case 'R': print_esc("nonstopmode"); break;
    case 'S': print_esc("scrollmode");
    }     /* there are no other cases */
    print("...");
    print_ln();
    update_terminal;
    return;
  }
```

This code is used in section 83.

Why?

Why do we want
cweb Source Code of TEX ?

- Toolchain
- Modification
- Debugging
- Education
- Experiments

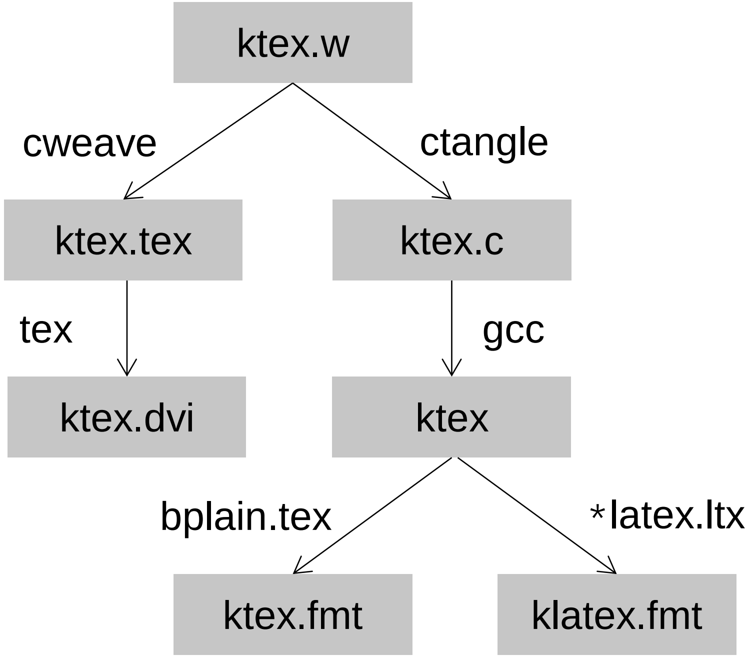
Example: ktex.w

- tex.web
  + etex.ch
  + 32bit pointer type
  + kpathsea library
  = ktex.w
- It is not the purest implementation of TEX .
- It is a useful basis.
- It is still close to the original TEX .

Why?

Why do we want
cweb Source Code of $\TeX$?

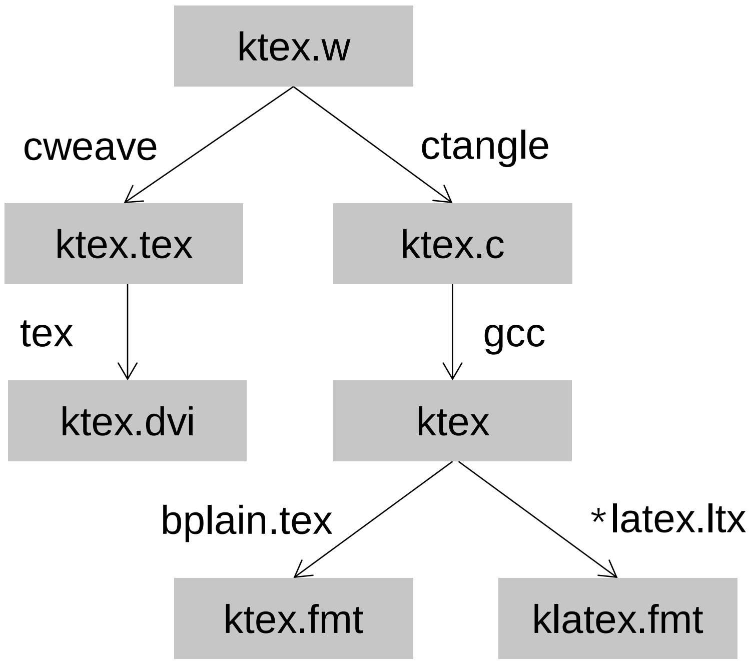
- **Toolchain**
- Modification
- Debugging
- Education
- Experiments



Why?

Why do we want
cweb Source Code of $\TeX$?

- Toolchain
- **Modification**
- Debugging
- Education
- Experiments



Why?

Why do we want
cweb Source Code of TEX?

- Toolchain
- Modification
- **Debugging**
- Education
- Experiments

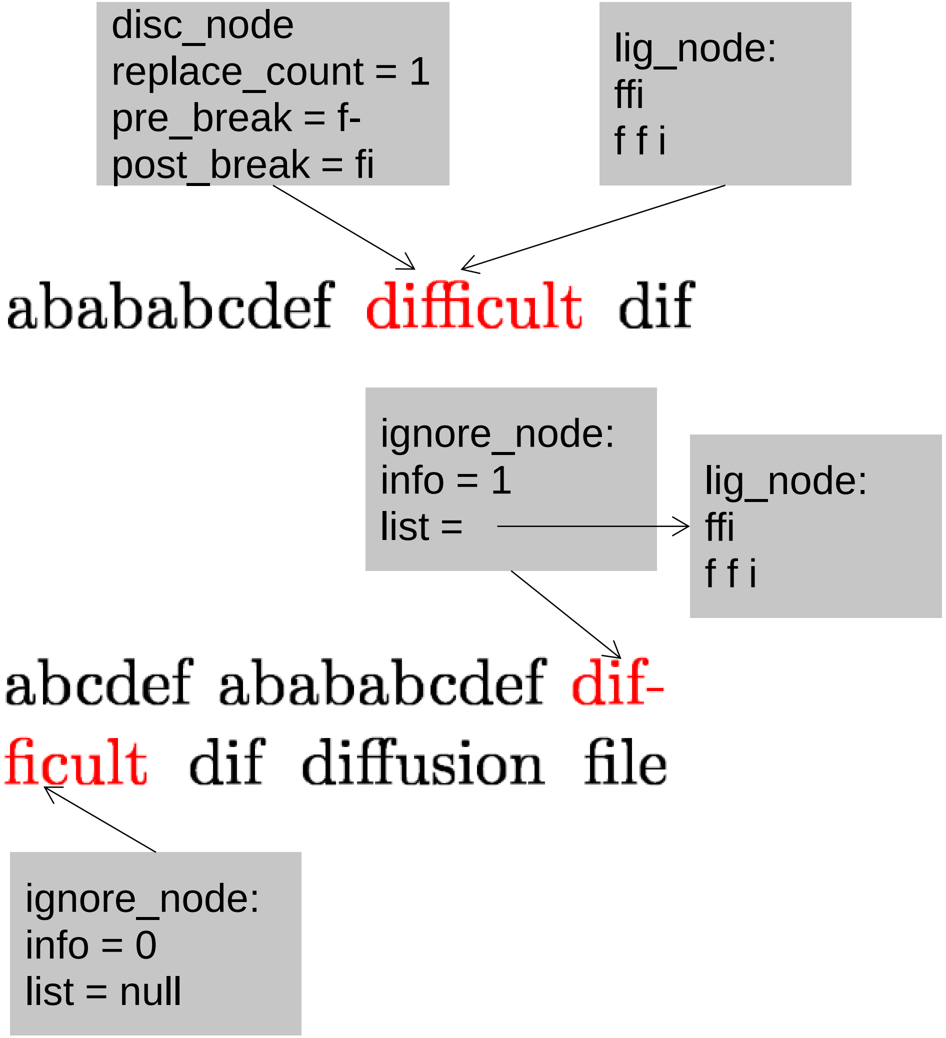
Example: HintView, the HINT viewer.

- Backend:
  - literate cweb programs
- User Interface:
  - **C (Windows)**
  - Java (Android)
- Rendering:
  - OpenGL

Why?

Why do we want
cweb Source Code of TEX?

- Toolchain
- Modification
- **Debugging**
- Education
- Experiments



disc_node
replace_count = 1
pre_break = f-
post_break = fi

lig_node:
ffi
f f i

abababcdef difficult dif

ignore_node:
info = 1
list =

lig_node:
ffi
f f i

abcdef abababcdef dif-
ficult dif diffusion file

ignore_node:
info = 0
list = null

Why?

Why do we want
cweb Source Code of TEX?

- Toolchain
- Modification
- Debugging
- **Education**
- **Experiments**

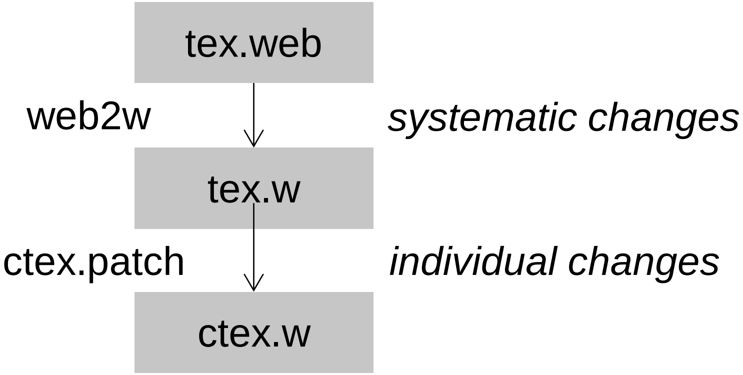
How ?

- Start with tex.web
- Apply web change files, e.g. ε-TEX
- Apply patch files
- Convert web file to cweb file
  - run web2w
  - apply patch file
- Apply cweb change files, e.g. for kTEX
- For TEXrelated projects
  - Extract code and Link

How ?

- Start with tex.web
- Apply web change files, e.g. ε-TeX
- Apply patch files
- Convert web file to cweb file
  - run web2w
  - apply patch file
- Apply cweb change files, e.g. for kTeX
- For TeX related projects
  - Extract code and Link

The basis: ctex.w

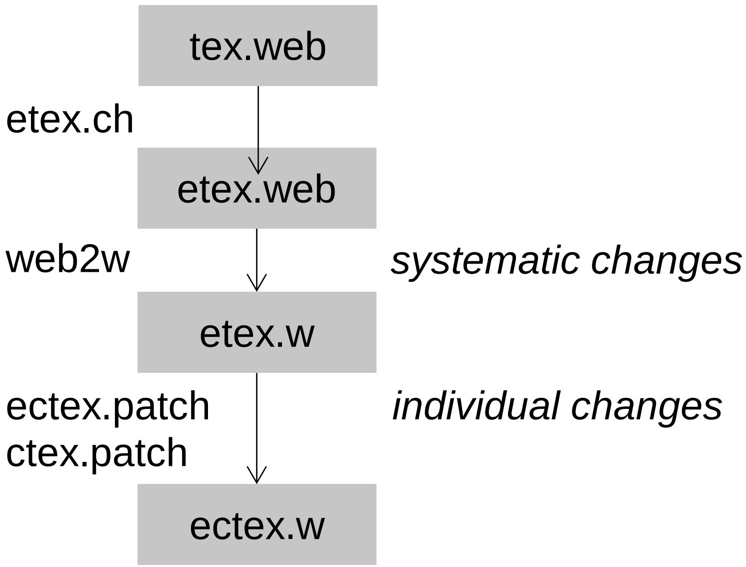


- Close to Don Knuth's original TeX
- Passes trip test
- No command line
- No kpathsearch

How ?

- Start with tex.web
- Apply web change files, e.g. ε-TEX
- Apply patch files
- Convert web file to cweb file
  - run web2w
  - apply patch files
- Apply cweb change files, e.g. for kTEX
- For TEX related projects
  - Extract code and Link

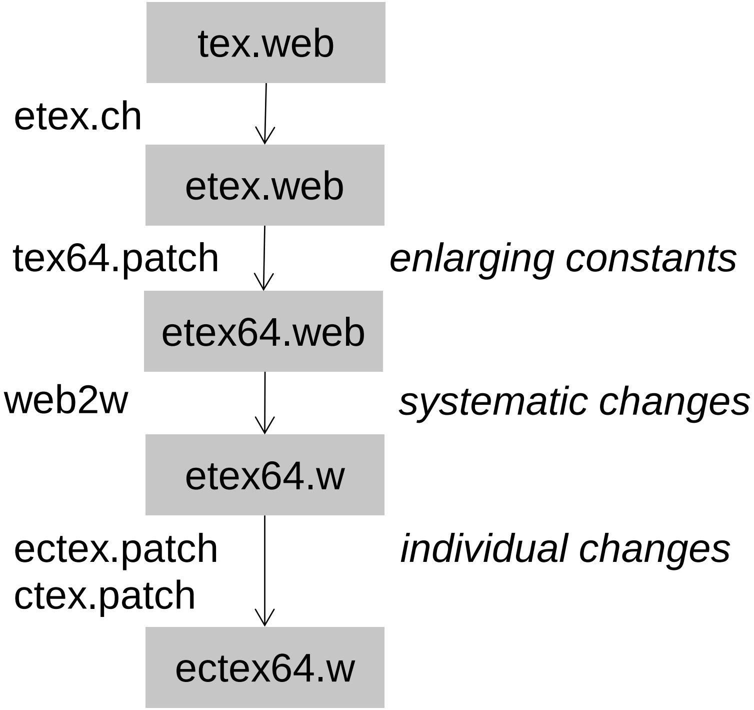
The extended basis: ectex.w



- Extended features of ε-TEX

How ?

- Start with tex.web
- Apply web change files, e.g. ε-TEX
- Apply patch files
- Convert web file to cweb file
  - run web2w
  - apply patch files
- Apply cweb change files, e.g. for kTEX
- For TEX related projects
  - Extract code and Link



tex.web

etex.ch

etex.web

tex64.patch

enlarging constants

etex64.web

web2w

systematic changes

etex64.w

ectex.patch
ctex.patch

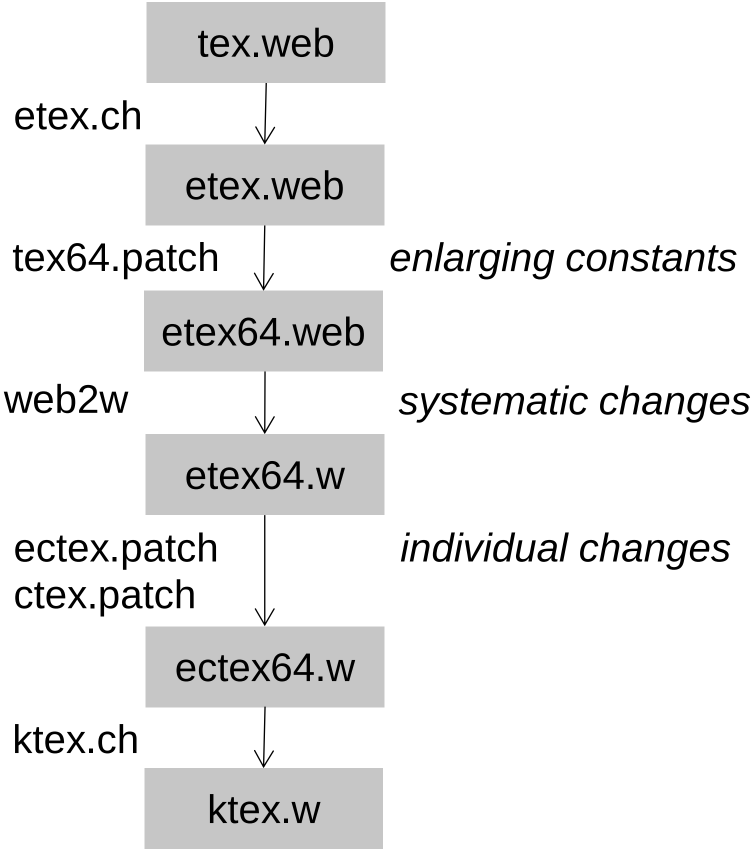
individual changes

ectex64.w

- Large constants, e.g. 64 bit memory words
- Extended features of ε-TEX

How ?

- Start with tex.web
- Apply web change files, e.g. ε-TEX
- Apply patch files
- Convert web file to cweb file
  - run web2w
  - apply patch files
- Apply cweb change files, e.g. for kTEX
- For TEX related projects
  - Extract code and Link



- TEX Live compatible TEX engine

What?
systematic changes: Macros

- web2w translation of WEB macros to cweb macros

WEB:

```
@d define(#)==if global then geq_define(#)@+else eq_define(#)

...

@<Assignments@>=

set_font: define(cur_font_loc, data, cur_chr);
```

cweb:

```
@d define(A, B, C) if (global) geq_define(A, B, C);@+else eq_define(A, B, C)
```

What?
systematic changes: Macros

- New in web2w version 1.0

WEB:

```
@d char_info_end(#)==#].qqqq
@d char_info(#)==font_info[char_base[#]+char_info_end
...
   cur_h:=cur_h+char_width(f)(char_info(f)(c));
```

cweb:

```
@d char_info(A, B) font_info[char_base[A]+B].qqqq
...
   cur_h=cur_h+char_width(f, char_info(f, c));
```

What?

individual changes: nonlocal goto

```
  @<Error hand...@>=
  static void jump_out(void)
- {@+goto end_of_TEX;
+ {@+ close_files_and_terminate(); exit(0);
  }
```

What?

individual changes: cwebmac.tex has no \L

```
  @<Types...@>=
  typedef int scaled; /*this type is used for scaled integers*/
- typedef int32_t nonnegative_integer; /*$0\L x<2^{31}$*/
+ typedef int32_t nonnegative_integer; /*$0\le x<2^{31}$*/
  typedef int8_t small_number; /*this type is self-explanatory*/
```

What?

individual changes: single character strings

```
  @<Put each...@>=
- primitive('-', discretionary, 1);
+ primitive("-", discretionary, 1);
  @!@:Single-character primitives -}{\quad\.{\\-}@>
```

What?

individual changes: use / as directory separator

```
- @d TEX_area "TeXinputs:"
+ @d TEX_area "TeXinputs/"
  @.TeXinputs@>
- @d TEX_font_area "TeXfonts:"
+ @d TEX_font_area "TeXfonts/"
  @.TeXfonts@>
```