The Web at 25
Lessons Learned, Forgotten, and Rediscovered

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Line-mode browser hack days
Line-mode browser?

CERN Web history projects

- [http://line-mode.cern.ch/](http://line-mode.cern.ch/)
- [https://github.com/cern-hackdays/lmb](https://github.com/cern-hackdays/lmb)
- [@thefirstwebsite](https://www.twitter.com/thefirstwebsite)
Greetings from... CERN?

“Vague, but exciting...”

From http://www.w3.org/History/1989/proposal.html
An interdisciplinary team

Meeting with Robert Cailliau
The first open-source software?

A step back for Tim & Robert...
More history lessons

- “Nature abhors a vacuum”
  - Robert disagreed with the lack of an imperative programming language

- “Be liberal in what you require but conservative in what you do”
  - Robert favored strict interpretation of HTML by the browser

- The URL
  - The core invention of the Web, and the only part with a dependency on a centralized system

Research
Planning

Design approach

- Follow as many of the core web principles as possible
- Replicate the LMB user experience
- Leverage as much of the modern browser stack as possible
Code archaeology...

```
# more QuickGuide.html
<TITLE>QuickGuide -- /lineMode/<TITLE>
<NEXTID 8>
(H)<line Mode Browser(/H)>The line mode browser allows you to find information by following
references and/or by using keywords.(P)
References are numbers in {brackets} after particular phrases. Type the number and RETURN for more information on the phrase.(P)
Some documents are indexes. These contain little text, but allow you to search for information with keywords. Type "m" (space) and the keywords. For example, "m smr examples" searches the index for items with keywords SMR and EXAMPLE. You can only use the "m" command when it is present in the prompt.(P)
See also (A NAME=3 HREF=Commands.html)other commands(/A), (A NAME=2 HREF=Commands.html)command Line syntax(/A), (A NAME=4 HREF=Shortcuts.html)shortcuts(/A),
(A NAME=7 HREF=Installation.html)Installation(/A),
(A NAME=5 HREF=http://info.cern.ch/hypertext/WWW/LineMode/More.html)Deeper det
ails(/A). Please send any bugs and suggestions to timbl@nwsc01.cern.ch.

ADDRESS(A NAME=0 HREF=http://info.cern.ch/hypertext/TBLDisclaimer.html)Tim BL
/A)
QuickGuide.html: F10
S: 0000  NUM (1.025,027)
```

<header> or <head>?

```
1 <HEADER>
2 <TITLE>The World Wide Web project</TITLE>
3 <NEXTID N="55">
4 </HEADER>
5 <BODY>
```

Source from http://info.cern.ch/hypertext/WWW/TheProject.html
<p> as a separator</p>

The WorldWideWeb (W3) is a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents.

Source from http://info.cern.ch/hypertext/WWW/TheProject.html

```
<hp>? <h0>?

1027 case S_tag_h:
1028     switch(character) {
1029         case 'p':
1030             state = S_high_phrase;
1031         break;
1032         case 'P':
1033             state = S_high_phrase;
1034             break;
1035         case '0':
1036             case '1':
1037             case '2':
1038             case '3':
1039             case '4':
1040             case '5':
1041             case '6':
1042                 state = S_tag_h_num;
1043                 heading_level = character;
1044                 break;
```

Source from WWW.c, version 0.12, dated 28-8-91
The first style sheet!

```c
176 /* Example Style Sheet */
177 /* ==================== */
179 /*
180 PRIVATE para_style normal_style = { 3, 3, 0, 0, 0, 0, 0, 0, 0};
181 PRIVATE para_style list_style = { 7, 10, 0, 0, 0, 0, 0, 1, 1};
182 PRIVATE para_style glossary_style = { 7, 27, 0, 0, 0, 0, 0, 1, 1};
183 PRIVATE para_style mono_style = { 0, 0, 0, 0, 0, 0, 0, 0, 0};
184 PRIVATE para_style address_style = { 4, 4, 0, 1, 0, 0, 0, 0, 0};
185 PRIVATE para_style heading_style[7] = {
186   /* TITLE */                               { 0, 0, 0, 1, 0, 0, 0, 0, 1},
187   /* H1 */                                  { 0, 0, 0, 2, 1, 1, 0, 1, 1},
188   /* H2 */                                  { 0, 0, 0, 0, 1, 1, 0, 0, 0},
189   /* H3 */                                  { 2, 2, 0, 0, 0, 0, 0, 0, 0},
190   /* H4 */                                  { 4, 4, 0, 0, 0, 0, 0, 0, 0},
191   /* H5 */                                  { 6, 6, 0, 0, 0, 0, 0, 0, 0},
192   /* H6 */                                  { 8, 8, 0, 0, 0, 0, 0, 0, 0},
193 } /* end of heading styles */
```

Source from WWW.c, version 0.12, dated 28-8-91

...and testing
And in the end...

Simulation solution

- 310 lines of node.js JavaScript
  - Proxies HTTP requests/responses
  - Strips “unknown” tags, author’s CSS
  - Injects our custom CSS and the LMB command line
- 265 lines of CSS
- 354 lines of client-side JavaScript
  - HTML5 audio for mechanical keyboard sounds
  - Canvas to mimic character-by-character rendering
  - Handling of command line input
- Bookmarklet in 119 lines of JavaScript
Visiting the web’s birthplace (a hallway)

Tim BL’s design principles

- Simple
- Modular
- Tolerant
- Decentralized
- Least powerful language
Concerns about the Web today

- Information system or application platform?
  - Great for bringing basic CS skills to all
  - Current client-side application paradigms make content a second-class citizen

- The Web is not for all
  - We’re still fighting for accessibility
  - Video content is surpassing all other types
  - No new, great society – walled gardens remain

Learning from history

- “The web being simple and forgiving has led to its enormous growth” – Robert Cailliau

- Minimum viable product

- Iterate early in a product’s lifecycle
Be good stewards of the Web

- “Cool URLs don’t change”
- Content first
- Hypermedia APIs
- Backwards compatible and future friendly
- Progressively enhanced
- Power of the hyperlink