Down with the fancy pants!

How people have been optimizing the wrong things and increased complexity.

Jan Schaumann <jschauma@etsy.com>
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@jschauma
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Onions!

http://etsy.me/Lliiuo
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Distractions!

http://etsy.me/KQDDSU
The Art of Yak Shaving!

(Yak Wool)

http://etsy.me/nn3QDV

http://etsy.me/LlIZsf
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http://etsy.me/L6tJ40

Silver Bullets!
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Silver Bullets!
Sorry!

http://etsy.me/L6tJ40
How do we build websites?
http://etsy.me/LieAZe
How do we build websites?

large scale
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Load Balancer
HTTP Servers
Message Broker
Database
Storage System

Systems Architect
DNS

#dadops
Exciting, right?
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http://etsy.me/zQMzBn
Remember how a web server used to work?
Remember how a web server used to work?

**Client:** "Hello, I'd like to get the contents of this file, please."

```
GET / HTTP/1.0
```
Remember how a web server used to work?

**Client:** "Hello, I'd like to get the contents of this file, please."

GET / HTTP/1.0

**Server:** "Why, certainly, here you go."

cat file > socket
Remember how a web server used to work?

**Client:** "Hello, I'd like to get the contents of this file, please."

```plaintext
GET / HTTP/1.0

```

**Server:** "Why, certainly, here you go."

```plaintext
cat file > socket
```

http://etsy.me/L8TeSc
HTTP today...

Client: "Hello, I'd like to get the contents of this file on this server, please."

GET / HTTP/1.1
Host: this-server

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HTTP today...

**Client:** "Hello, I'd like to get the contents of this file on this server, please."

GET / HTTP/1.1
Host: this-server

**Server:** "I'm sorry, Node.js just crashed."

HTTP/1.1 500 Internal Server Error
Server: Apache-Coyote/1.1
HTTP today...

**Client:** "Hello, I'd like to get the contents of this file on this server, please."
GET / HTTP/1.1
Host: this-server

**Server:** "I'm sorry, Node.js just crashed."
HTTP/1.1 500 Internal Server Error
Server: Apache-Coyote/1.1

http://etsy.me/LlGtC5
HTTP today...

**Client:** "Uhm... Node.js? I thought you said you're an Apache server?"

**Server:** "Oh, sure, but I hand off LESS compilation to Node.js, which is faster than Rhino."
HTTP today...

Client: "Uhm... Node.js? I thought you said you're an Apache server?"

Server: "Oh, sure, but I hand off LESS compilation to Node.js, which is faster than Rhino."

Client: "Uhm... Rhino? So you're... running Javascript inside Java?"

Server: "Oh, sure, I'm a Tomcat server!"
HTTP today...

Client: "Uhm… Node.js? I thought you said you're an Apache server?"

Server: "Oh, sure, but I hand off LESS compilation to Node.js, which is faster than Rhino."

Client: "Uhm… Rhino? So you're… running Javascript inside Java?"

Server: "Oh, sure, I'm a Tomcat server!"

Client: "So I'm talking to… your Coyote 'HTTP connector', which hands my requests off to your 'Catalina servlet container', which…"

Server: "…looks up stuff in various databases, triggers actions in a message broker and hands the LESS compilation off to Node.js…"
HTTP today...

Client: "Uhm… LESS? 'Compilation'? Why don't you just serve the plain old CSS?"

Server: "Don't be silly. 'All problems in computer science can be solved by another level of indirection.' Now where was I?"

Server: "Oh, right: …hands the LESS compilation off to Node.js, which just crashed."
HTTP today...

Client: "My head hurts. How did we get here?"

http://etsy.me/Lb57Y0
“Complex systems fail in complex ways.”

Steven M. Bellovin
Optimize for human time.
Is less really more?

/* Compiled CSS */

#header h1 {
  font-size: 26px;
  font-weight: bold;
}
#header p {
  font-size: 12px;
}
#header p a {
  text-decoration: none;
  &:hover {
    border-width: 1px;
  }
}

http://etsy.me/KU1wJr
<script src="less.js" type="text/javascript"></script>
$ wc less-1.3.0.min.js
  8 955 47054 less-1.3.0.min.js
$ more less-1.3.0.min.js

//
// LESS - Leaner CSS v1.3.0
// http://lesscss.org
//
// Copyright (c) 2009-2011, Alexis Sellier
// Licensed under the Apache 2.0 License.
//
(function(a,b){function c(b){return a.less[b.split("/")[1]]}})

(function(l){var a=document.getElementsByTagName("style");
for(var b=0;b<a.length;b++)a[b].type.match(j)&&(new d.Parser).parse(a[b].innerText||"",function(c,d){var e=d.toCSS(),f=a[b];f.type="text/css",f.styleSheet?f.styleSheet.cssText=e:f.innerText=e));

(function(m,a,b){for(var c=0;c<a.sheets.length;c++)n(d.sheets[c],a,b,d.sheets.length-(c+1))})

(function n(b,c,e,f){var h=a.location.href.replace(/\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?\?";e&g(g)=[new Date(g)].valueOf()==(l.timestamp).valueOf()?l.css,b,c(null,null,a,b,{local:1,remaining:f});else try{new d.Parser({optimization:d.optimization,paths:[i.replace(/\W\-+/g,"")],mime:b.type,filename:m}).parse(a,function(d,e){if(d)return u(d,i);try{c(d,e,a,b,local:1,remaining:g,remaining:f)},s(document.getElementById("less-erro
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--

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tree.JavaScript = function (string, index, escaped) {
    this.escaped = escaped;
    this.expression = string;
    this.index = index;
};

    tree.JavaScript.prototype = {
    eval: function (env) {
        var result,
            that = this,
            context = {};

            var expression = this.expression.replace(/@\{([\w-]+)\}/g, function (_, name) {
                return tree.jsify(new(tree.Variable)('@' + name, that.index).eval(env));
            });

        try {
            expression = new(Function)('return (' + expression + ')');
    } catch (e) {
        throw { message: "JavaScript evaluation error: \" + expression + \"" };
    }
};
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$ wc less-1.3.0.min.js
  8    955   47054 less-1.3.0.min.js
$ more less-1.3.0.min.js
 //
 // LESS - Leaner CSS v1.3.0
 // http://lesscss.org
 //
 // Copyright (c) 2009-2011, Alexis Sellier
 // Licensed under the Apache 2.0 License.
 //
(function(a,b){function c(b){return a.less[b.split("/")[1]]}function l(){var a=document.getElementsByTagName("style");for(var b=0;b<a.length;b++)a[b].type.match(j)\&\&(new d.Parser).parse(a[b].innerHTML||"",function(c,d){var e=d.toCSS(),f=a[b];f.type="text/css",f.styleSheet?f.styleSheet.cssText=e,f.innerHTML=e})}function m(a,b){for(var c=0;c<d.sheets.length;c++)n(d.sheets[c],a,b,d.sheets.length-(c+1))}function n(b,c,e,f){var h=a.location.href.replace(/\[/g,"").*,"),i=b.href.replace(/\[/g,"").*,"),j=g&g getItem(i),k=g&g getItem(i+"\":timestamp"),l={css:j,timestamp:k};^(https:\/\/file)\/\/.test(i)||(i.charAt(0)=="/");i=a.location.protocol+"+a.location.host+i=i.slice(0,h.lastIndexOf("\":")+1)+i);var m=i.match(\([^\[/]+\$)\[1]\);q(b.href,b.type,function(a,g){if(!e&&l&&g&&(new Date(g)).valueOf()==(new Date(l.timestamp)).valueOf())p(l.css,b),c(null,null,a,b,\{local:1,remaining:f\});else try\{new d.Parser({optimization:d.optimization,paths:[i.replace(/\[/g,""],mime:b.type,filename:m]}).parse(a,function(d,e){if(d)return u(d,i);try{c(d,e,a,b,\{local:1,lastModified:g,remaining:f\}),s(document.getElementById("less-erro
$ wc jsmin.c
  299     978    8029 jsmin.c
$ tail -n 20 jsmin.c
   break;

/* main -- Output any command line arguments as comments
   and then minify the input. */
extern int
main(int argc, char* argv[])
{
    int i;
    for (i = 1; i < argc; i += 1) {
        printf(stdout, "// %s\n", argv[i]);
    }
    jsmin();
    return 0;
}
$
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I USE SEMI-COLONs

http://etsy.me/LrIexP
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“Premature optimization is the root of all evil.”

Donald Knuth
Optimize for human time.
How do we build websites?
Etsy

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http://etsy.me/w2pZPN
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/bin/sh

http://etsy.me/L6Gb5O
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```
stdin  stdout  stderr

/bin/sh
```

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$(\text{stdin}) \quad (\text{stdout}) \quad (\text{stderr})$

```bash
awk(1)

/bin/sh
```

```
<<< < | > >>
```
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```
/bin/sh

stdin  stdout  stderr

awk(1)  sed(1)  uniq(1)

<<  <  |  >  >>

wc(1)
```
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```
/bin/sh

stdin        stdout        stderr

awk(1)        sed(1)

*roff(1)

<<<        <        |      >        >>

lam(1)        comm(1)        sort(1)

awk(1)

/hbin/sh/

col(1)        wc(1)        paste(1)

fmt(1)

uniq(1)
```
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text stream | text stream
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http://etsy.me/LoKw0B

...it is on!

http://etsy.me/LoKFRA

New Jersey vs. MIT
text stream  |  text stream
XML makes me YAML.
XSLT is a language with an XML-based syntax that is used to transform XML documents into other XML documents...
$ plutil -convert xml1 /System/Library/LaunchDaemons/login.plist -o - | more

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
.plist version="1.0">
<dict>
  <key>Disabled</key>
  <true/>
  <key>Label</key>
  <string>com.apple.rlogind</string>
  <key>ProgramArguments</key>
  <array>
    <string>/usr/libexec/rlogind</string>
  </array>
  <key>SessionCreate</key>
  <true/>
  <key>Sockets</key>
  <dict>
    <key>Listeners</key>
    <dict>
      <key>SockServiceName</key>
      <string>login</string>
    </dict>
  </dict>
</dict>

XML makes me YAML.
The Dunning-Kruger effect applies to Domain-Specific Languages, too.
http://www.jsonml.org/

“The purpose of JsonML is to provide a compact format for transporting XML-based markup as JSON which allows it to be losslessly converted back to its original form.”

On the internet, nobody knows if you’re trolling.

http://etsy.me/Lbsj8k
object | object
tool1 | tool2

**Public:**
- color: orange
- shape: rect

**Private:**
- corners: round

**Public:**
- color: orange
- shape: rect

**Private:**
- corners: angular
Complexity simplified:

• “essential complexity” is inherent to the problem and **cannot** be reduced
Complexity simplified:

• “essential complexity” is inherent to the problem and cannot be reduced

• “accidental complexity” is inadvertent and frequently introduced indirectly
object | object
Choices of Message Queue?

We've been using SysV Message Queue for our distributed data processing system for over 15 years. For some reason, we want to replace it with newer Message Queue mechanism. Is there any suggestions?

Requirements:

1. Fast response, minimizing message queue system overhead
2. Multiple client language library support, mainly c, c# and java
3. Can do some HA configuration to prevent SPOF
4. Have logging ability to check who sends message and who receives message

I've found Apache ActiveMQ and RabbitMQ, but it seems RabbitMQ lacks of stable C client library support?

Choices of Message Queue?

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http://etsy.me/eZxOwz
Total Cost of Ownership

- purchase price
- time to evaluate solution
- support contract
- time to deploy solution
- savings in $resource
- time to on-ramp staff
- time to integrate with existing tools
- time to debug/update/maintain
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http://etsy.me/LkuGI5
Total Cost of Ownership

- purchase price
- support contract
- savings in $resource
- time to evaluate solution
- time to deploy solution
- time to on-ramp staff
- time to integrate with existing tools
- time to debug/update/maintain

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Software maintenance is ~75% of TCO.
Software maintenance is ~75% of TCO.

Operational costs are the other 75%.
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http://etsy.me/Lj89aR
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- minor PHP upgrade
- various ruby gems added / updated
- libmemcached, sqlite, zlib, and openssl updated

http://etsy.me/Lj8hqI
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http://etsy.me/HT7BJm

- runs linux
- minor PHP upgrade
- libmemcached, sqlite, zlib, and openssl updated
- various ruby gems added / updated

http://etsy.me/Lj8hqI
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http://etsy.me/LtSSrp
“Adding manpower to a late software project makes it later.”

Brooks’s Law
Brooks’s Law *also* holds for software endpoints.
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Group Intercommunication Formula:

\[
\text{# of channels of communication} = \frac{n(n-1)}{2}
\]

5 developers:

\[
5 \frac{(5-1)}{2} = 10
\]

10 developers:

\[
10 \frac{(10-1)}{2} = 45
\]

50 developers:

\[
50 \frac{(50-1)}{2} = 1225
\]
Brooks’s Law *also* holds for software endpoints.

Adding independent components to a software architecture increases complexity *exponentially*.
“Optimization is the process of taking something that works and replacing it with something that almost works, but costs less.”

Roger Needham
Identify *accidental* and *essential* complexity. Eliminate the former, *then* optimize the latter.
• “Complex systems fail in complex ways.” (Bellovin)
• “Premature optimization is the root of all evil.” (Knuth)
• “Worse is better (is worse is still better).” (Gabriel)
• “Complexity increases non-linearly.” (Brooks)
• “Complexity is the enemy of security.” (Schneier)

• echo “import this” | python

http://etsy.me/Ly59Ly  http://etsy.me/LlIZsf  http://etsy.me/LnMCv7
Optimize for human time.
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http://etsy.me/L8WcGD
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Related talks, presentations and articles in no particular order:


- [http://is.gd/uCnnMg](http://is.gd/uCnnMg)