



Want a 2.0ish Web site? Hop!

Ludovic Courtès





challenge: talk about the **web** in an HPC lair

1

The Web

Aggregators Wikis Folksonomy User Centered Joy of Use
Blogs Participation Six Degrees Usability Widgets
Pagerank XFN Recommendation Social Software FOAF Browser
Videocasting Podcasting Sharing Collaboration Perpetual Beta Simplicity AJAX
Audio IM Video **Web 2.0** Design
Convergence CSS Pay Per Click
UMTS Mobility Atom XHTML SVG Ruby on Rails VC Trust Affiliation
OpenAPIs RSS Semantic Web Standards SEO Economy
OpenID Remixability REST Standardization The Long Tail
DataDriven Accessibility XML
Modularity SOAP Microformats Syndication

A photograph of Sir Tim Berners-Lee sitting at a desk with two computer monitors. The monitors display the text 'THE WIDE WORLD OF THE WEB' and 'SOFT'. He is wearing a striped shirt and a watch. An orange rounded rectangle contains the text 'Web 1.0'.

Web 1.0

Sir Tim Burners-Lee

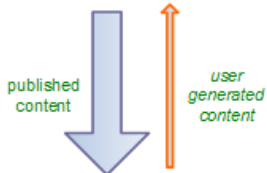
Web 2.0



Web 1.0

"the mostly read-only Web"

250,000 sites



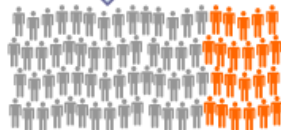
45 million global users

1996

Web 2.0

"the wildly read-write Web"

80,000,000 sites



1 billion+ global users

2006

browser

```
graph TD; browser[browser] --> webserver[Web server];
```

The diagram consists of two rounded rectangular boxes. The top box is yellow with the word 'browser' in black text. A vertical black arrow points downwards from the bottom center of the yellow box to the top center of the bottom box. The bottom box is black with the words 'Web server' in white text.

`GET /index.html`

Web server

browser



Web server

`<HTML><HEAD> ... </HTML>`

browser



```
graph TD; browser[browser] --> webserver[Web server];
```

GET /index.html

Upgrade: websocket

Web server

browser

JavaScript code



Web server

blah blah...

browser

JavaScript code



Web server

blah blah..

AJAX



inri

inri
inri**x**
inri **meaning**
inri **traffic**
inri**a**
inri**va**
inri **cristo**
inri**ch**
inri **clothing**
inri**hab lyrics**

[Advanced search](#)
[Language tools](#)

Google Search

I'm Feeling Lucky

- Mail
- Carnet d'adresses
- Calendrier
- Tâches
- Porte-documents
- Préférences

Dossiers

- ↳ Réception (1)
- Discussions
- Envoyé
- Brouillons
- Spam
- Corbeille
- hpc-annonce
- INBOX.hop
- INBOX.hpc-annonce
- Sent.gnu
- Rechercher des partages

Recherches

Tags (libellés)

- gnus-dormant
- gnus-download
- gnus-expire
- gnus-forward
- gnus-save
- sed

Rechercher

Mail Rechercher Enregistrer Avancé

Affichage 100 sur 11625 mails

	De	Objet	Dossier	Taille	Reçu
<input type="checkbox"/>			Réception	15 ko	12:19
<input type="checkbox"/>			Réception	88 ko	10:24
<input type="checkbox"/>			Réception	33 ko	10:19
<input type="checkbox"/>			Réception	322 ko	9:41
<input type="checkbox"/>		[diffusion-bso] Les mardis du développement technologique, cet après-midi - (Réception	146 ko	9:38
<input type="checkbox"/>			Réception	32 ko	9:33
<input type="checkbox"/>			Réception	3 Mo	14 Oct
<input type="checkbox"/>			Réception	14 ko	14 Oct
<input type="checkbox"/>			Réception	7 ko	14 Oct



Octobre 2013

Lun	Mar	Mer	Jeu	Ven	Sam	Dim
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

(English below.)

Le Service d'expérimentation et de développement (SED) vous convie aux Mardis du développement technologique, dont la prochaine édition a lieu aujourd'hui, 15 octobre de 14h à 17h15 en salle Ada Lovelace.

Liste d'amis

typical client-side code

```
<html>
<head>
<script>
function showUser(str) {
  if (str=="") {
    document.getElementById("txtHint").innerHTML="";
    return;
  }
  xmlhttp = new XMLHttpRequest();
  xmlhttp.onreadystatechange=function() {
    if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
      document.getElementById("txtHint").innerHTML=xmlhttp.responseText;
    }
  }
  xmlhttp.open("GET","getuser.php?q="+str,true);
  xmlhttp.send();
}
</script>
</head> <body>
<form>
<select name="users" onchange="showUser(this.value)">
<option value="">Select a person:</option>
<option value="1">Peter Griffin</option>
<option value="2">Lois Griffin</option>
</select> </form>
<div id="txtHint"><b>Person info will be listed here.</b></div>
</body> </html>
```


typical client-side code

```
<html>
<head>
<script>
function showUser(str) {
  if (str=="") {
    document.getElementById("txtHint").innerHTML="";
    return;
  }
  xmlhttp = new XMLHttpRequest();
  xmlhttp.onreadystatechange=function() {
    if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
      document.getElementById("txtHint").innerHTML=xmlhttp.responseText;
    }
  }
  xmlhttp.open("GET","getuser.php?q="+str,true);
  xmlhttp.send();
}
</script>
</head> <body>
<form>
<select name="users" onchange="showUser(this.value)">
<option value="">Select a person:</option>
<option value="1">Peter Griffin</option>
<option value="2">Lois Griffin</option>
</select> </form>
<div id="txtHint"><b>Person info will be listed here.</b></div>
</body> </html>
```

typical server-side code

```
<?php
$q = intval($_GET['q']);

$con = mysqli_connect('localhost','peter','abc123','my_db');
if (!$con) {
    die('Could not connect: ' . mysqli_error($con));
}
mysqli_select_db($con, "ajax_demo");
$sql = "SELECT * FROM user WHERE id = '". $q . "'";
$result = mysqli_query($con, $sql);

echo "<table border='1'>
<tr>
<th>Firstname</th>
<th>Lastname</th>
<th>Age</th>
</tr>";

while($row = mysqli_fetch_array($result)) {
    echo "<tr>";
    echo "<td>" . $row['FirstName'] . "</td>";
    echo "<td>" . $row['LastName'] . "</td>";
    echo "<td>" . $row['Age'] . "</td>";
    echo "</tr>";
}
echo "</table>";

mysqli_close($con);
?>
```

typical server-side code

```
<?php
$q = intval($_GET['q']);

$con = mysqli_connect('localhost','peter','abc123','my_db');
if (!$con) {
    die('Could not connect: ' . mysqli_error($con));
}
mysqli_select_db($con, "ajax_demo");
$sql = "SELECT * FROM user WHERE id = '". $q . "'";
$result = mysqli_query($con, $sql);
```

```
echo "<table border='1'>
<tr>
<th>Firstname</th>
<th>Lastname</th>
<th>Age</th>
</tr>";
```

```
while($row = mysqli_fetch_array($result)) {
    echo "<tr>";
    echo "<td>" . $row['FirstName'] . "</td>";
    echo "<td>" . $row['LastName'] . "</td>";
    echo "<td>" . $row['Age'] . "</td>";
    echo "</tr>";
}
echo "</table>";

mysqli_close($con);
?>
```

can we do better?

2

HOP!



<http://hop.inria.fr/>



<http://cuicui.bordeaux.inria.fr:9000/hop/cuicui/>



Bienvenue sur cui-cui™!



15 minutes

2 tiers

1 language

Cuicui !

trolol! :-P

— pluto

ouah c'est super !

— pluto

HOP anatomy

- **Scheme2Js** compiler (Florian Loitsch)
- **HTTP server**, in Scheme (Manuel Serrano)
- **run-time support**, Scheme + JS (Manuel Serrano)

3

Competitors & co.

similar **one-language/two-tier** approach, in OCaml

similar **one-language/two-tier** approach, in OCaml

20 contributors!

SPOCK

<http://wiki.call-cc.org/eggref/4/spock>

- **Scheme-to-Javascript compiler**
- client-side only
- no widget & co. libraries

- **Scheme interpreter written in JavaScript**
- client-side only

Node.js

<http://nodejs.org/>

- **JavaScript implementation**
- typically server-only
- large community

4

The End

executive summary

- Web 2.0 = **distributed programming**
- PHP + HTML + JavaScript + XML + JSON + ... = **insanity**
- **HOP** → unified two-tier programming, **wonderful!**
- <http://hop.inria.fr/>

ludovic.courtes@inria.fr

<http://sed.bordeaux.inria.fr/>

The Inria logo is displayed in a white rounded square. The word "Inria" is written in a stylized, cursive font with a color gradient from red to orange.

Inria

Thanks!

The topic of the demo was inspired by Andy Wingo's talks *Dynamic Hacking with Guile* (FOSDEM 2011) and *GNU Guile: Free Software Means of Production* (FSCONS 2011).