3.3 Billion
Mobile phone for half the planet.

Flickr photo by Pingnews: http://www.flickr.com/photos/pingnews/370061022/
3.3 Billion in Perspective

http://communities-dominate.blogs.com/brands/2008/01/when-there-is-a.html
Gopher, Mosaic, WAP, iPhone

Flickr photo by: http://www.flickr.com/photos/vixon/352427852/
Gopher, Mosaic, WAP, iPhone

Flickr photo by: http://www.flickr.com/photos/vixon/352427852/
Gopher, Mosaic, WAP, iPhone

Flickr photo by: [Link to Flickr photo]
Gopher, Mosaic, WAP, iPhone

Flickr photo by: http://www.flickr.com/photos/vixon/352427852/
January 2008 Mobile Browser Stats

Source: www.netapplications.com
Yahoo!’s 13 Performance Rules (Now 34!)

1. Make Fewer HTTP Requests
2. Use a Content Delivery Network
3. Add an Expires Header
4. Gzip Components
5. Put Stylesheets at the Top
6. Move Scripts to the Bottom
7. Avoid CSS Expressions
8. Make JavaScript and CSS External
9. Reduce DNS Lookups
10. Minify JavaScript
11. Avoid Redirects
12. Remove Duplicate Scripts
13. Configure ETags

How do these rules apply to the mobile web?
Numerous Mobile Browsers: Little Documentation

- Access
- Access Netfront
- BlackBerry
- IE Mobile
- Motorola Internet Browser
- Nokia
- Openwave Mobile Browser
- Opera Mini
- Opera Mobile
- Palm
- Safari
- Samsung
- Teleca-Obigo
- WinWAP

No information on gzip support or # of concurrent connections.

Source: http://wurfl.sourceforge.net/
Cloud Four’s Mobile Browser Test

- Tests for number of concurrent connections and multiple domains.
- Looks for GZIP support.
- Looks for caching support.
- Works in any browser (even desktop):
  - No javascript
  - XHTML-MP
Cloud Four’s Mobile Browser Test

- Tests for number of concurrent connections and multiple domains.
- Looks for GZIP support.
- Looks for caching support.
- Works in any browser (even desktop):
  - No javascript
  - XHTML-MP
or simple text MOBILETEST to 41411.
How Does the Test Work?

- Generates a unique token for this test
- Records selected HTTP headers for later analysis
- Computes the finish time (microsecond granularity) for the test, based on the current time and our desired delay factor
- Creates a database record for the test, containing: the token, start time, finish time, and zeroed counters for four separate domains
- Generates and delivers the test page containing 64 small (4x4 px) image requests evenly distributed across four separate domains
- Waits for the browser to fetch all images and render the page
Initial Results — Still Looking for More Testers

- Over 2,900 tests
- 900 Unique User Agents
- 245 Unique Mobile User Agents
- Fun items like Kindle, PS3, Zune.

Graphs show:
- 83% of tests used GZIP compression
- 17% did not use GZIP
- 68% of tests used caching
- 32% did not use caching
<table>
<thead>
<tr>
<th>Browser</th>
<th>GZIP</th>
<th>Caching</th>
<th>Domain 1</th>
<th>Domain 2</th>
<th>Domain 3</th>
<th>Domain 4</th>
<th>Total Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackberry Browser</td>
<td>20%</td>
<td>71%</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>IE Mobile 6.x</td>
<td>83%</td>
<td>100%</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>IE Mobile 7.x</td>
<td>100%</td>
<td>89%</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Opera Mini 3.x</td>
<td>100%</td>
<td>100%</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Opera Mini 4.x</td>
<td>100%</td>
<td>0%</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Opera Mobile 8.x</td>
<td>86%</td>
<td>89%</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Safari (iPhone/iPod)</td>
<td>100%</td>
<td>100%</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Symbian (WebKit)</td>
<td>100%</td>
<td>100%</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
## Other Mobile Browsers

<table>
<thead>
<tr>
<th>Browser</th>
<th>GZIP</th>
<th>Caching</th>
<th>Domain 1</th>
<th>Domain 2</th>
<th>Domain 3</th>
<th>Domain 4</th>
<th>Total Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger Hiptop</td>
<td>0%</td>
<td>?</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Jataayu</td>
<td>100%</td>
<td>0%</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>NetFront 3.x</td>
<td>87%</td>
<td>100%</td>
<td>1 to 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 to 4</td>
</tr>
<tr>
<td>Nokia Browser</td>
<td>100%</td>
<td>100%</td>
<td>1 to 7</td>
<td>0 to 5</td>
<td>0 to 1</td>
<td>0 to 1</td>
<td>4 to 12</td>
</tr>
<tr>
<td>Obigo</td>
<td>0%</td>
<td>0%</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Open Wave Mobile 6.2</td>
<td>100%</td>
<td>0%</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Palm Blazer</td>
<td>71%</td>
<td>50%</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>SEMC Browser</td>
<td>100%</td>
<td>?</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>UP.Browser</td>
<td>50%</td>
<td>100%</td>
<td>1 to 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 to 4</td>
</tr>
<tr>
<td>Zune</td>
<td>100%</td>
<td>100%</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>64</td>
</tr>
</tbody>
</table>
Preliminary Conclusions from Our Tests

• GZIP support is much better than we anticipated.

• Caching support is much less than we anticipated.

• Full 3G speeds will only come for Windows Mobile and Blackberries after they address their browser deficiencies (concurrent connections, rendering engines and processor speed).

• Apple started pushing speed argument with 3G iPhone. Until other browsers change, this will continue to be effective argument.

• Lots of variability between browsers means necessary testing.

• Still much to learn about mobile browser performance.
Highlighted Recommendations for Mobile

<table>
<thead>
<tr>
<th>1. Turn on GZIP Compression</th>
<th>4. Minimize File Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Fewer Files</td>
<td>5. Simple, Valid Markup</td>
</tr>
</tbody>
</table>

Likely benefit from all 34 Yahoo! guidelines.  
Recommendations for Post iPhone Devices

1. Optimize javascript performance
2. Reduce DOM elements
3. Lazy Load Components
4. Use GET unless you need POST
5. Use JSON instead of XML
6. Use hardware accelerated effects
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Test Your Work!
WARNING
DIFFICULT TRAIL AHEAD
HIGH, NARROW, STEEP, SLIPPERY TERRAIN
PROCEED WITH CAUTION
Thank You for Your Time

Take Our Test

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Mobile Concurrency Test: http://cloudfour.com/mobile/