Fathom: A Browser-based Network Measurement Platform

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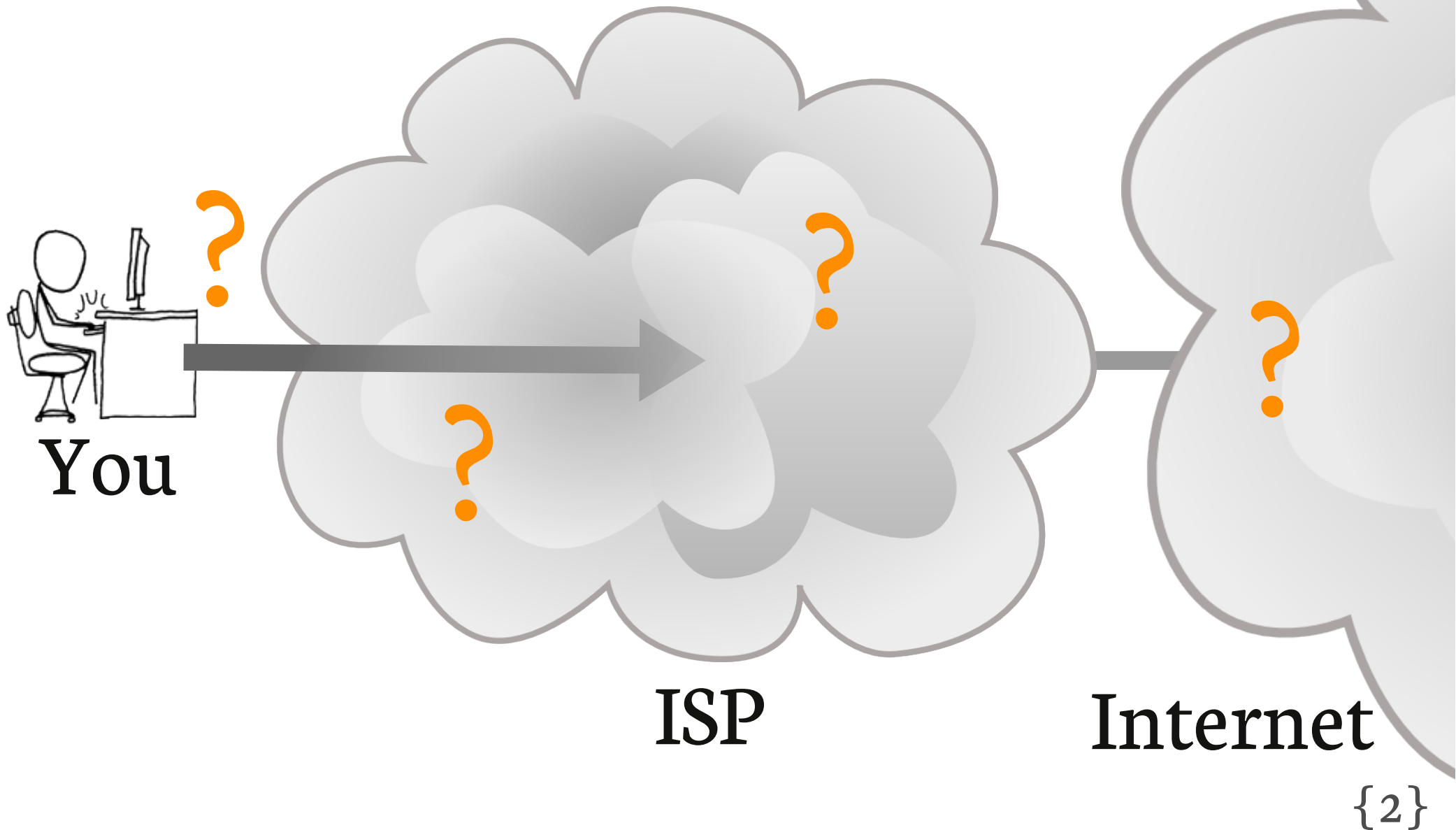
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User/edge-centric measurement

You

ISP

Internet

User-centric measurement

- Dasu
- Homenet Profiler
- Hostview

I ❤ Netalyzr

- Shaperprobe
- Speedtests

User-centric measurement

- Dasu   Vuze plugin, Java
- Homenet Profiler   Java app
- Hostview   native app

I 💗 Netalyzr   Java applet

- Shaperprobe   native app
- Speedtests   JavaScript, Flash

A better platform?

+ Everywhere   − No real API

+ All the time   − Security model

Wouldn't this be sweet?

```html
<html>
<body>
  <script type="text/javascript">
    function tr_callback(results) { ... }
    measurements.traceroute("google.com",
                            tr_callback);
  </script>
</body>
</html>
```

Wouldn't this be sweet?

HarrierMan Level 1
2/11/09

What is up with Google Maps? It is either incredibly slow or pages
just don't appear unless I click on the 'Still loading ...Slow? Try
Basic HTML' button that has started to appear at the of of the
page. This has happening for at least a week, maybe much
longer. My connection runs at about 6Mb/sec and is fine for other
sites so this is a google map issue. I notice many other posts over
the last year where people have had problems at times when I
haven't so is just my turn to be frustrated?

{7}

Wouldn't this be sweet?

Mike CH 🔲   3/10/09 ▾

Hiya,

To make progress with this, we'll need some more information from you. Ideally, answers to these questions from everyone:

1) When di   Maps and

2) Can you
now it takes   nds to come
back" etc.

3) Which bi   **Since when?**   i have?

4) What oth   **Quantify slowdown!**   chat clients,
etc installed

5) If you knc   **CPU load?**   e CPU
maxed out c

6) Which ar   **Location?**   but I'll take
country-leve

Any information you can provide will be very helpful.

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The browser design space

Intrusiveness (vertical label with downward arrow)

- ## In-page JavaScript
  - Pervasive, portable, lacking features
- ## Browser extensions
  - User privileges, lacking portability
- ## Runtime plugins
  - Portable, lacking features & security
- ## Custom plugins
  - Powerful, large effort, lacking portability
- ## Browser changes
  - Simply unrealistic

Fathom:
A measurement platform for Firefox

- Just one browser, but ...

- ... very nice sweet-spot of features!
  - Popular browser
  - JavaScript-only extension (→ open source)
  - Portable (across Firefox's platforms)
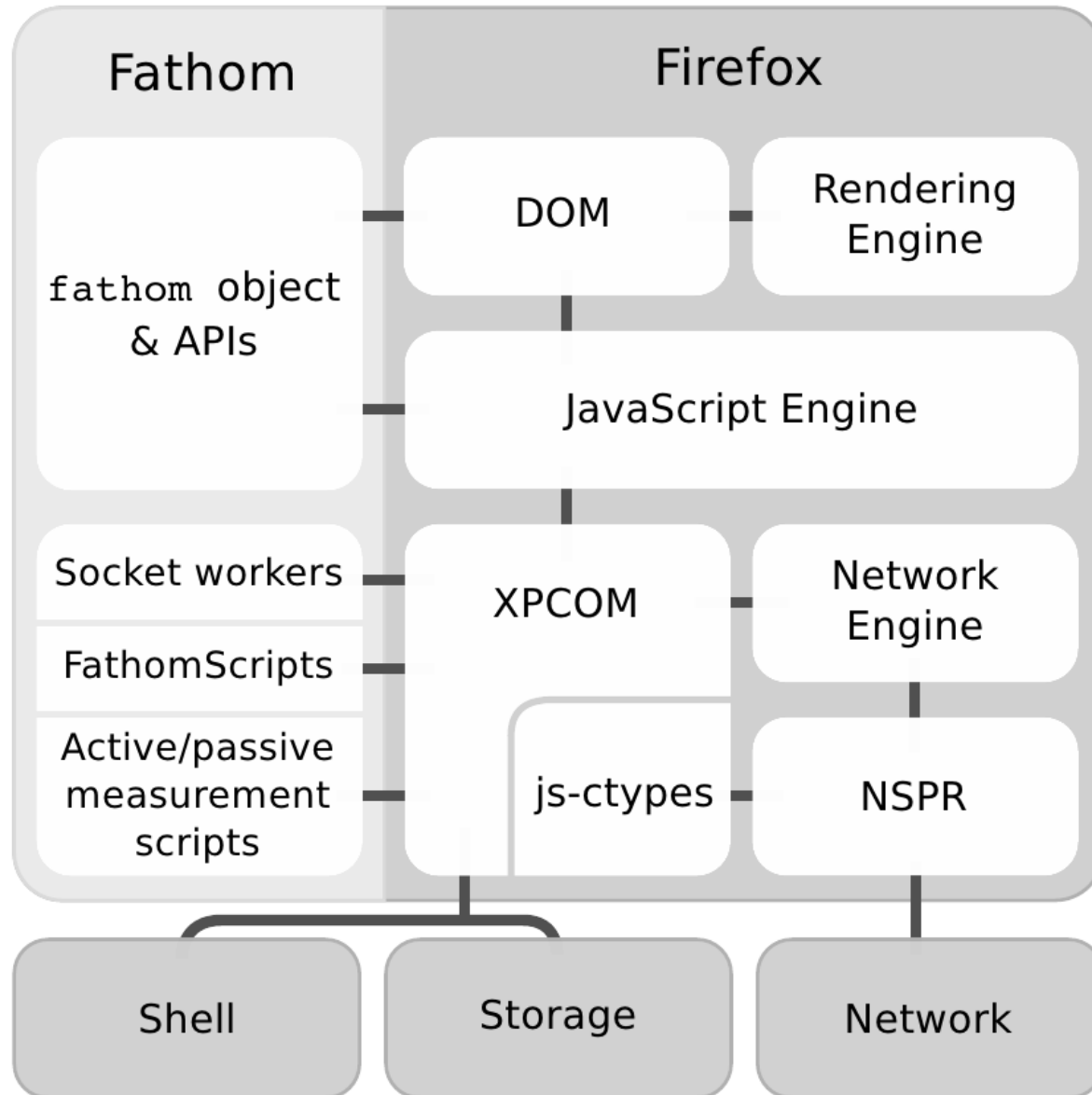 - Extension need "only" control mediation

Fathom?

Fathom?

Architecture

API

API	Availability in		
	JavaScript	Flash	Java Applet
fathom.socket.tcp.*	◐	◐	●
fathom.socket.udp.*	○	○	●
fathom.socket.broadcast.*	○	○	●
fathom.socket.multicast.*	○	◐	●
fathom.proto.dns.*	○	○	●
fathom.proto.http.*	◐	●	●
fathom.proto.mdns.*	○	○	●
fathom.proto.upnp.*	○	○	●
fathom.system.getActiveInterfaces()	○	○	●
fathom.system.getGateway()	○	○	◐
fathom.system.getRoutingTable()	○	○	◐
fathom.system.getResourceUsage()	○	○	◐
fathom.system.getWifiInfo()	○	○	◐
fathom.system.getNetworkUsage()	○	○	◐
fathom.system.doTraceroute()	○	○	◐
fathom.system.doPing()	○	○	◐
fathom.utils.browser.*	◐	◐	◐
fathom.utils.timer.*	●	●	●
fathom.utils.metrics.*	○	○	○
JavaScript & DOM access	●	◐	◐

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Security model: 5 mechanisms

- Client policy
  - Defines conditions enabling API access
- User confirmation
  - Not a great if relied upon heavily
- Script manifests
  - Declares desired resources up-front
- Server manifests
  - Controlled departure from same-origin policy
- Code signing
  - Establishes identity, permission management

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Demonstration

Conclusion

- Fathom: a browser-based measurement platform

- Early stage, but usable

- Contribute! Code, interns, browser gurus, ...

`http://fathom.icsi.berkeley.edu`