



Performance from the User's Perspective

Alois Reitbauer

A DIVISION OF COMPUWARE
dynaTrace
software

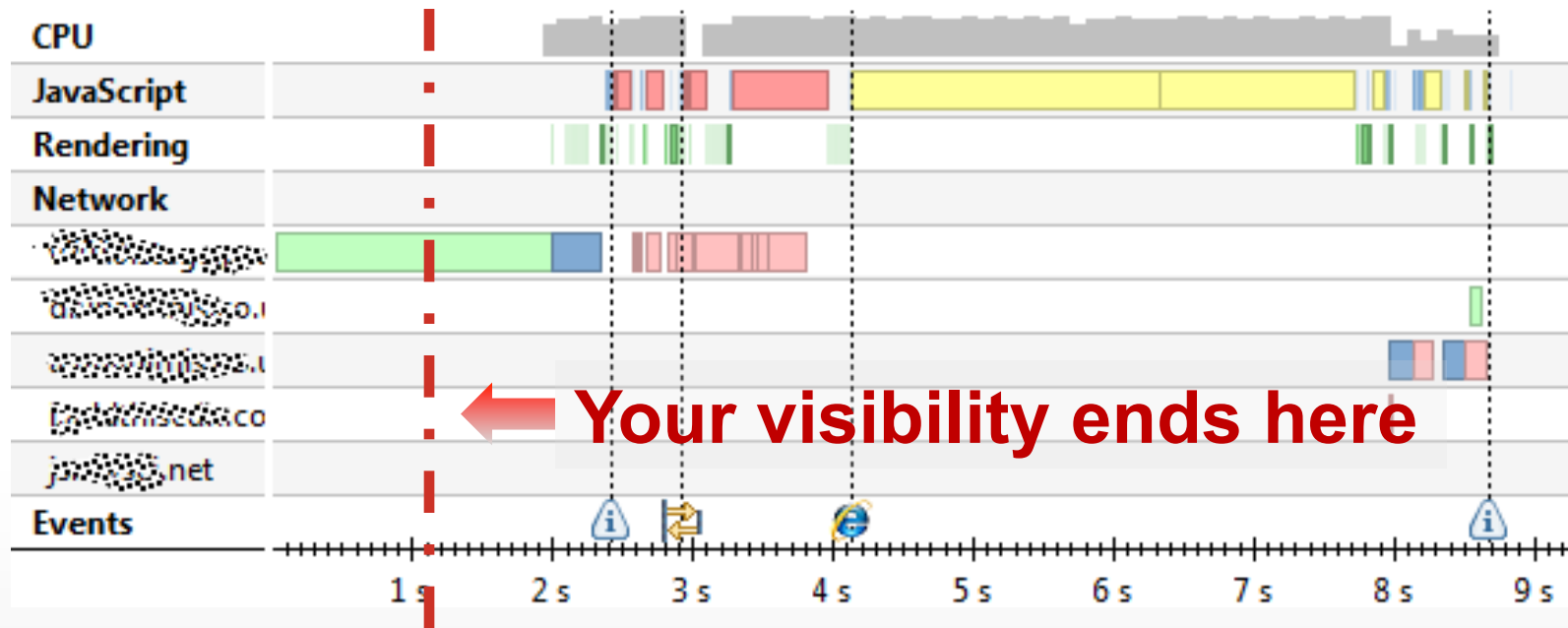


Disclaimer

**We used to
measure here**



We miss about 80%



... let's look at an example

Robots for Monitoring





Monitor from Everywhere



Robots are not humans

(even if they come close)

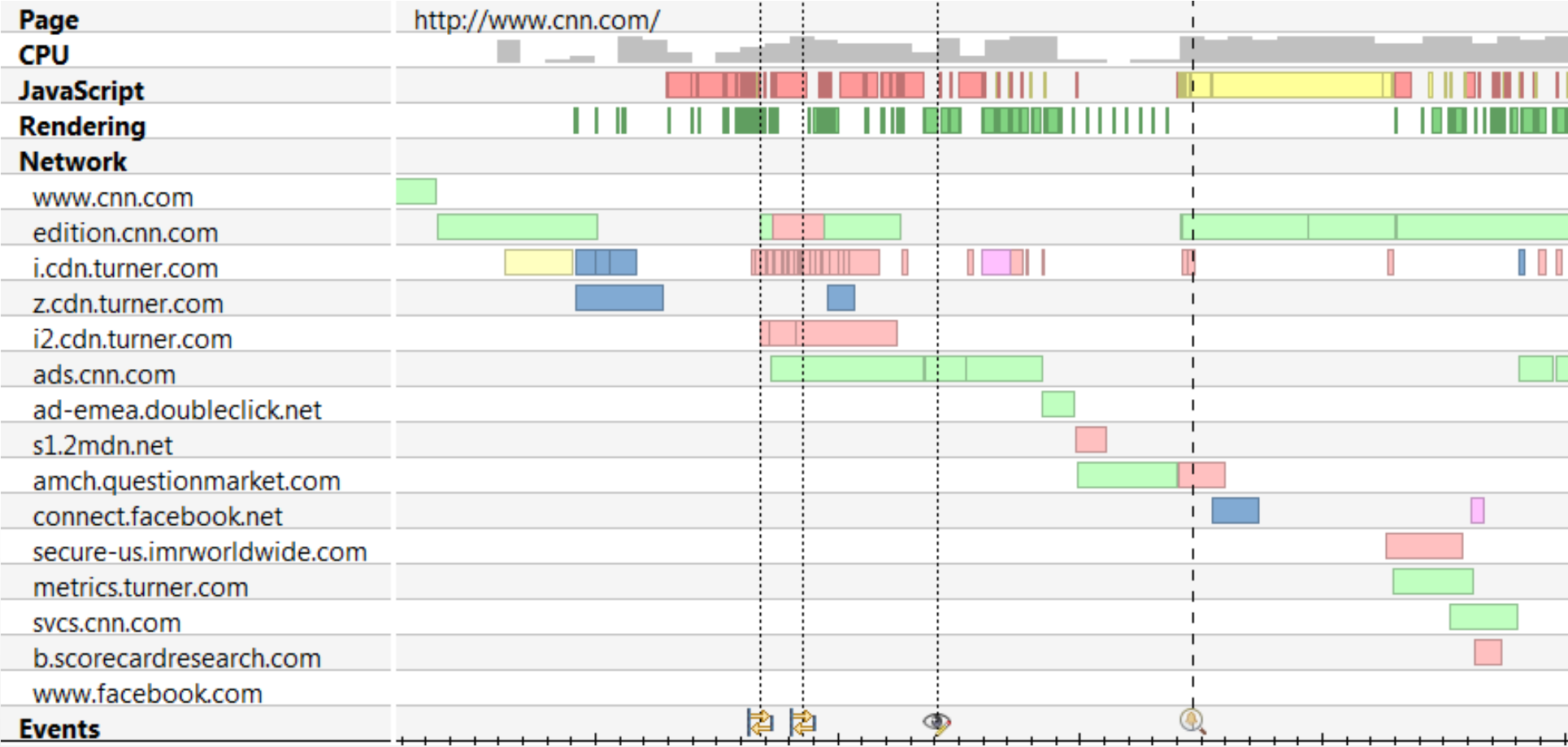
Challenges Today

Lack of standards

In Browser Measurement Complex

Most tools for development/troubleshooting

We need this ...



JACK NICHOLSON MORGAN FREEMAN

My
THE
a ROB REINER FILM
BUCKET LIST



Request Start Time

Time-to-First-Byte

Business Event Time

OnLoad Time

DNS/Network Time

Bandwidth

Rendering Time

Latency

(Geo)Location

JS Execution Time

Browser Info

Rendering Time

Resource Download Time

**... we want to get all this
information non intrusively
(aka hacking)**

OnLoad Time Measurement

```
<html>
  <head>
    <script type="text/javascript">
      var start = new Date().getTime();
      function onLoad() {
        var now = new Date().getTime();
        var latency = now - start; alert("page loading time: " + latency);
      }
    </script>
  </head>
  <body onload="onLoad()">
  .....
```

Resource Time Measurement

.....

```
<script type="text/javascript">
```

```
  downloadStart("myimg");
```

```
</script>
```

```

```

.....

**... browsers have all this
information, so why not
expose it**

W3C Performance Working Group

Views: desktop mobile print

STANDARDS PARTICIPATE MEMBERSHIP ABOUT W3C

WEB PERFORMANCE WORKING GROUP

The mission of the Web Performance Working Group, part of the [Rich Web Client Activity](#), is to provide methods to measure aspects of application performance of user agent features and APIs.

The Co-Chairs of the Working Group are [Arvind Jain](#) and [Jason Weber](#). The W3C Team Contact for the Web Performance Working Group is [Philippe Le Hégarat](#).

News

Got an idea for our next performance specification?
November 2011

We, in the Web Performance Working Group, are always wondering about the performance enhancement needs of Web applications. If you have an idea that is not currently addressed in one of our documents, let us know at public-web-perf@w3.org.

Last Call for User Timing and Performance Timeline

1 September 2011

We published two Last Call documents got published: [User Timing](#) and [Performance Timeline](#). As usual, we welcome feedback from everyone to public-web-perf@w3.org.

Last Call for Resource Timing

11 August 2011

We published a Last Call for [Resource Timing](#). We welcome feedback from everyone to public-web-perf@w3.org.

Last Call for Page Visibility

21 July 2011

We published a Last Call for [Page Visibility](#). We welcome feedback from everyone to public-web-perf@w3.org.

What is Web Performance?

Methods to measure aspects of application user agent features and APIs.

Your User Agent:

Navigation Timing:	0ms
Redirect:	0ms
App cache:	0ms
DNS lookup:	0ms
TCP Connection:	63ms
TCP Request:	126ms
Processing:	1401ms
Total page load:	1667ms

A DIVISION OF COMPUWARE
dynaTrace software

Compuware
THE TECHNOLOGY PERFORMANCE COMPANY

Web Performance Specs

Navigation Timing

Basic page navigation information

Resource Timing

Information about page resources (own & third party)

User Timing

Custom actions and high-res timer

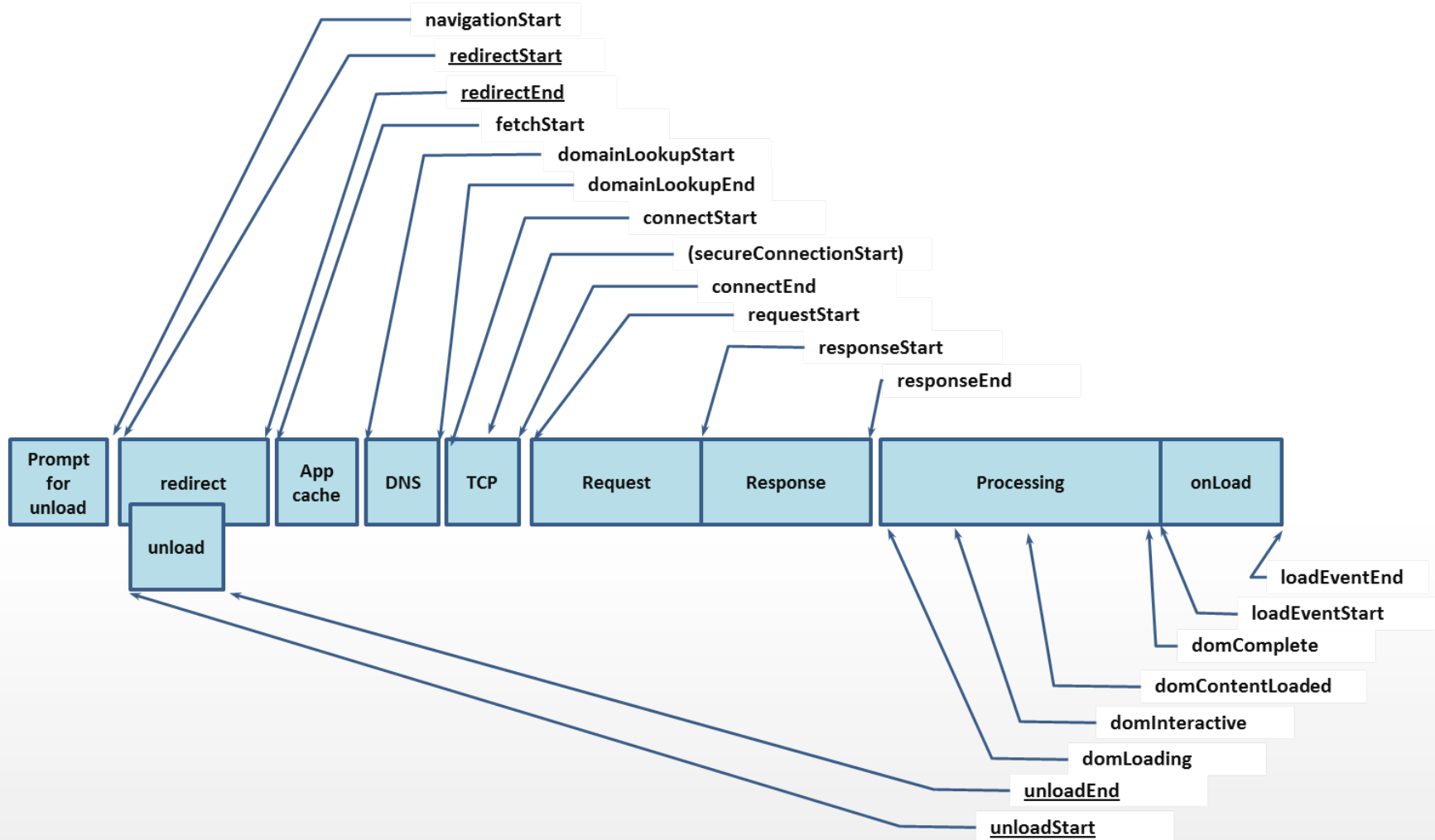
Timeline

Unified Access to Performance Data

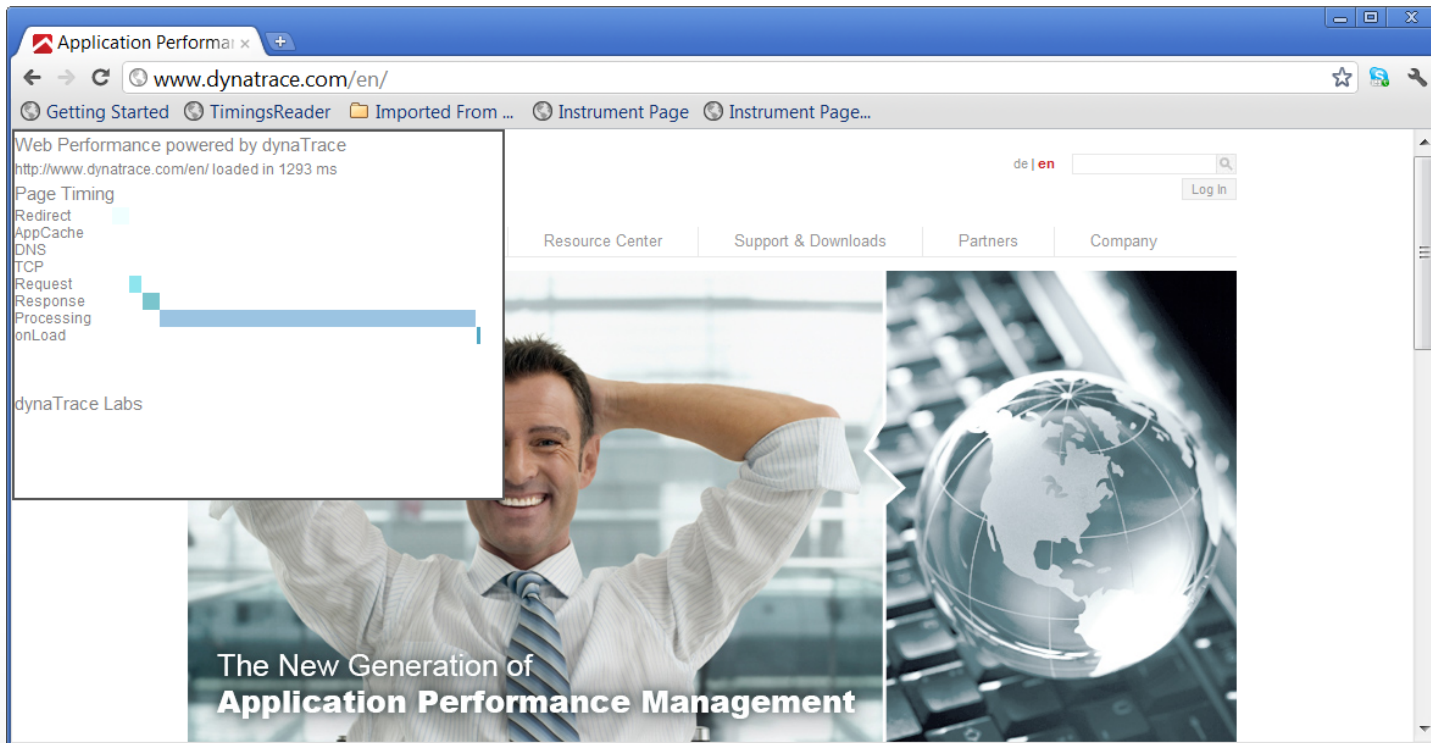
Understand Page Loading

Navigation Timing

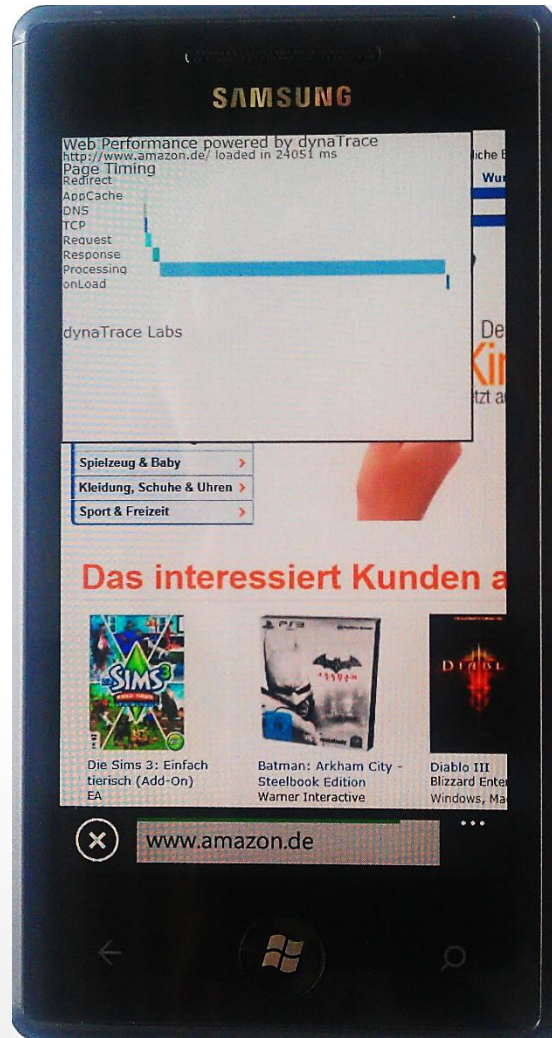
window.performance.timing.



Navigation Timing in Chrome



Navigation Timing on Windows Mobile

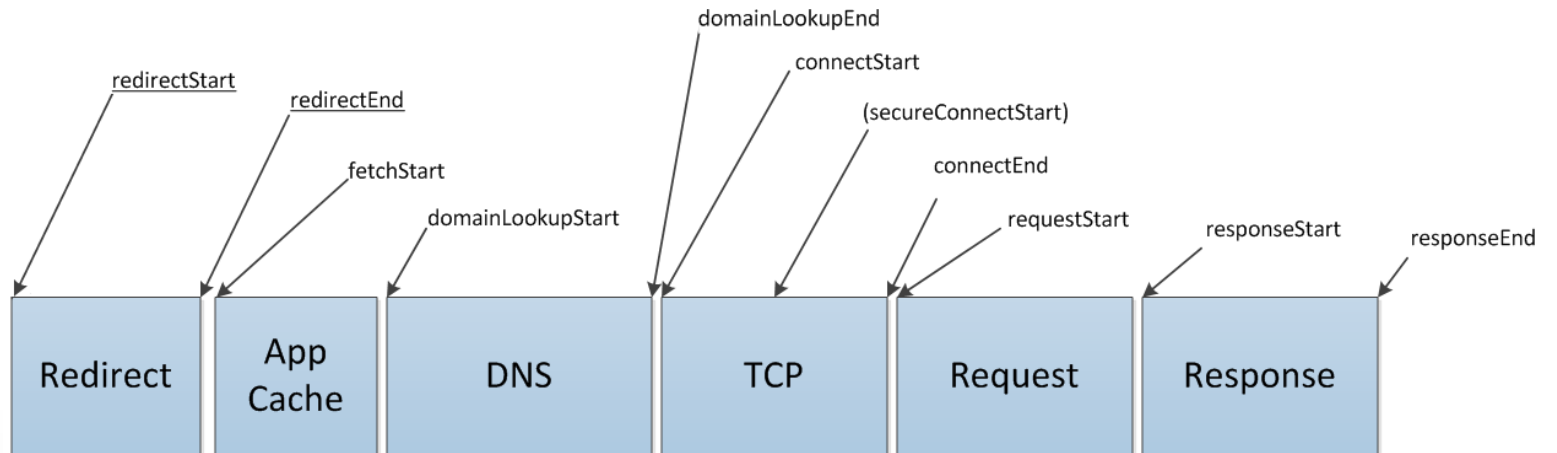


Let's try this ourselves ...

The page is not enough

Resource Timing

`window.performance.getEntriesByType(window.performance.PERF_RESOURCE)[].`



Custom Time Measurements

Marks

mark (markName)

add a new mark with the current timestamp

getMarks (markName)

Retrieve all marks with the specified name. If none is specified all marks will be returned

Result Structure:

```
{  
  <markName> : [<val1>, <val2>, ...]  
  .....  
}
```

Measures

measure ()

fetchStart -> now

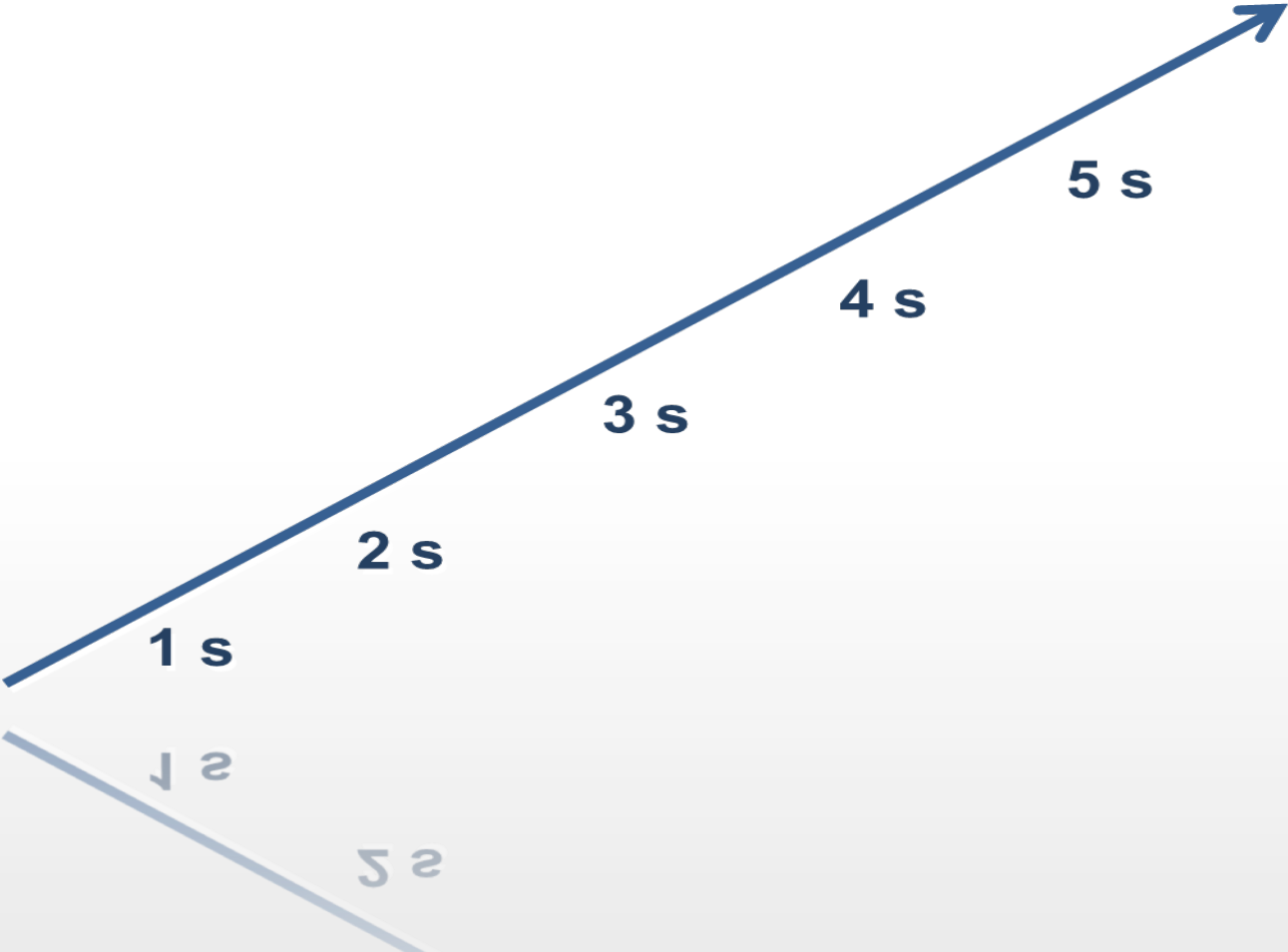
measure (startTime)

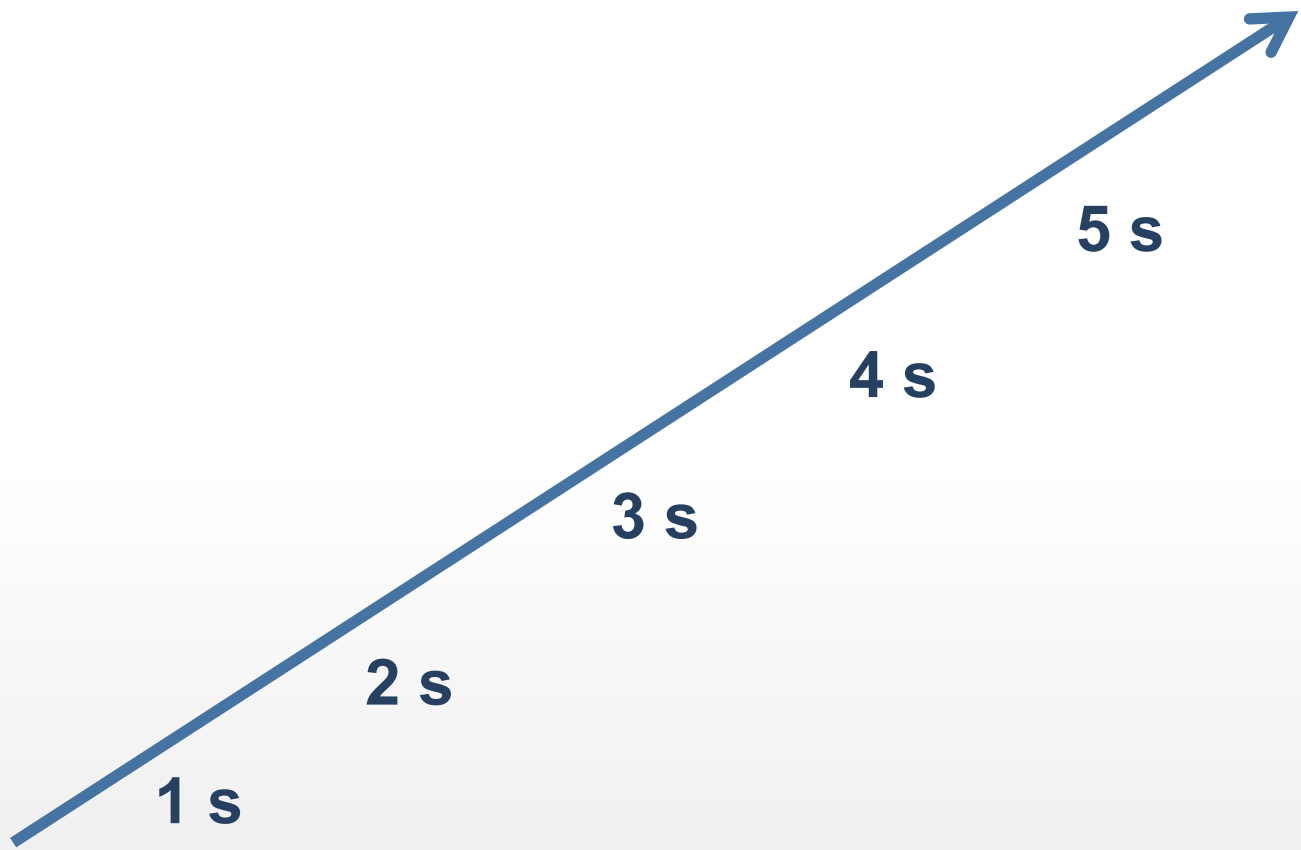
startTime -> now

measure(startTime, endTime)

startTime -> endTime

Performance Timeline







Browser Support



Open Issues

How to send the data back to the server

Rendering and JS Execution

Implementing the backend services

Full browser support

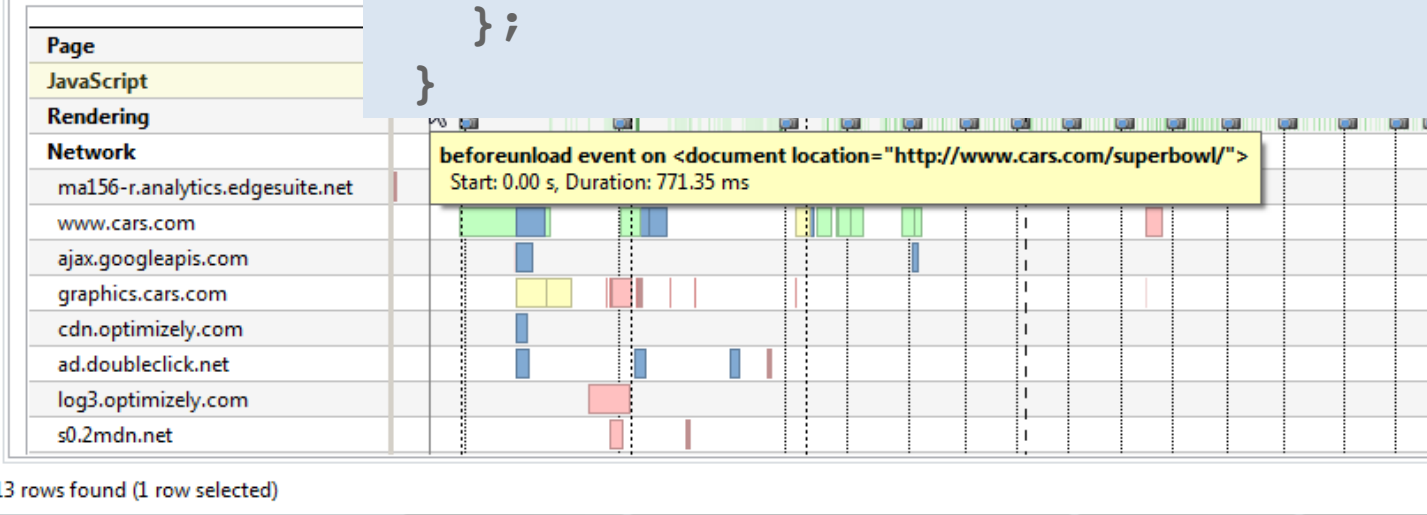
More efficient bandwidth measurement

Consistency

Blocking data transfer

```
if(isBrowserCloseEnabled)
{
    var startTime = new Date().getTime();
    while(((new Date().getTime()) - startTime) < 750)
    {
    };
}
```

Timeline



The Internet Explorer 6 Countdown

Moving the world off Internet Explorer 6

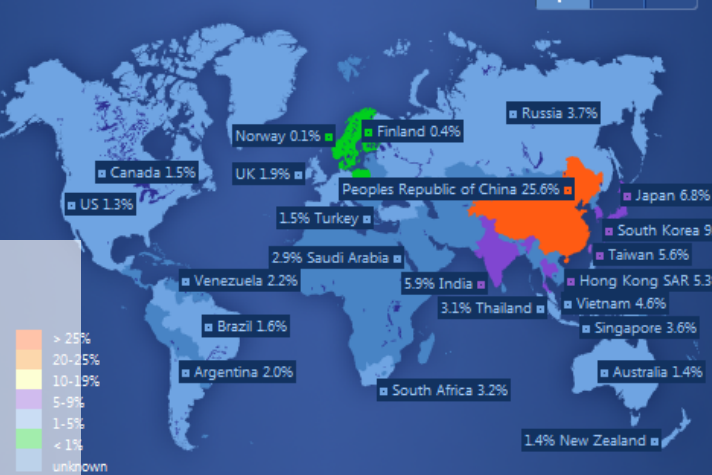
10 years ago a browser was born.

Its name was Internet Explorer 6. Now that we're in 2011, in an era of modern web standards, it's time to say goodbye.

This website is dedicated to watching Internet Explorer 6 usage drop to less than 1% worldwide, so more websites can choose to drop support for Internet Explorer 6, saving hours of work for web developers.

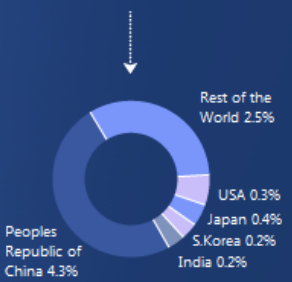
What you can do.

Internet Explorer 6 usage around the world



7.9% **2011 OCT**

of the world was using Internet Explorer 6, which was 7.5 percentage points less than the previous year



Breakdown of worldwide share by country/region

Source: Net Applications, Oct. 31 2011 data, Internet Explorer 6 usage share by country (all OS)

Welcome to the champions circle, Austria. Internet Explorer 6 usage had dropped below 1 percent there, ushering in a new era of modern web browsing.



JOIN THE CAUSE

Have a website? Encourage Internet Explorer 6 users to upgrade by displaying the countdown banner to Internet Explorer 6 users only. Get the word out on your site >



EDUCATE OTHERS

Friends don't let friends use Internet Explorer 6. And neither should acquaintances. Educate others about moving off of Internet Explorer 6. Why move off Internet Explorer 6 >



TELL YOUR FRIENDS

Let others know that you're doing your part to get Internet Explorer 6 to 1%.

[Tweet](#) 19.5K



Join the cause



Educate others



Tell your friends

Legacy Browsers

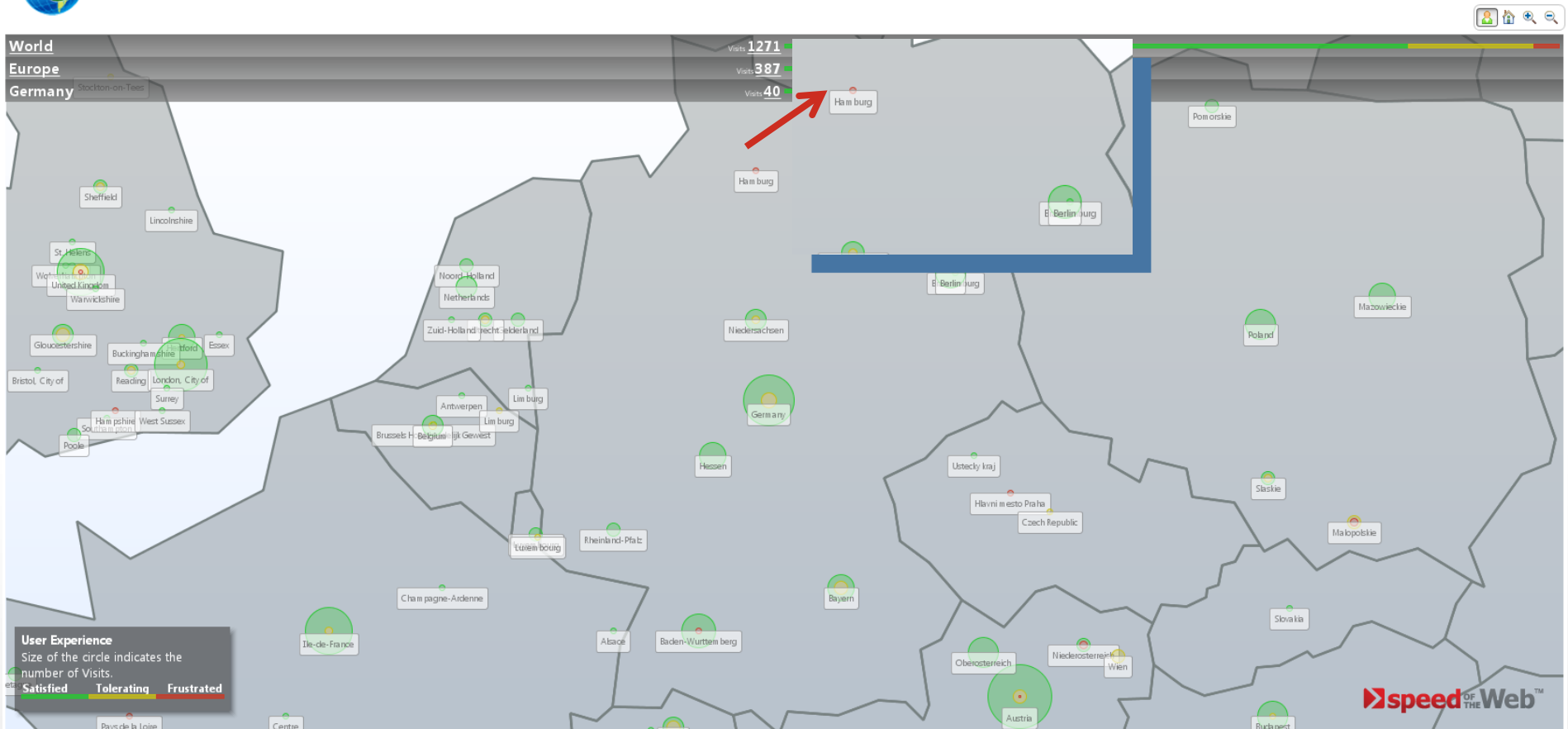
**Real world examples
what's possible today**

Identify Geo Hotspots



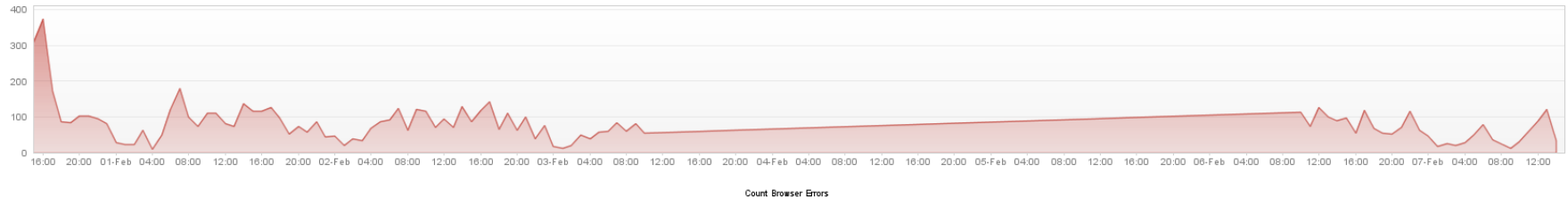
User Experience World Map

See where your visitors come from and learn if their user experience was satisfactory, tolerable or frustrating. Moushover the data points for details and right-click for drill-down information displayed in dashlets.

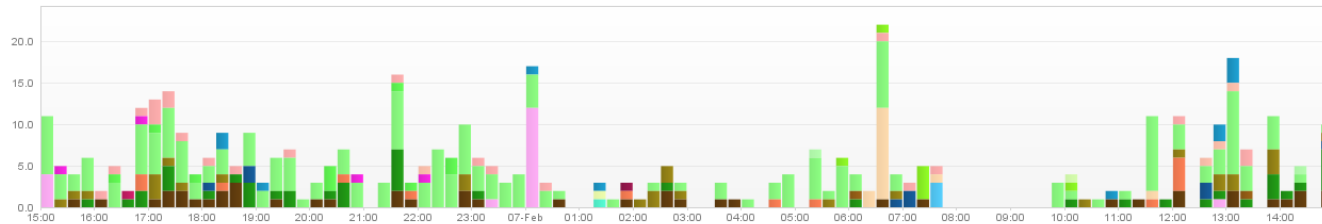


Page Error Monitoring

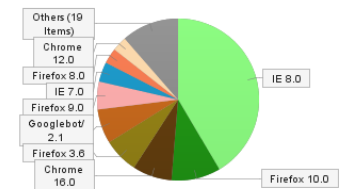
Browser Error Trend



Last 7 days Error Trends per Browser Version



Errors across Browser Versions



Error Hotspots by Error Type

Message
Message: [0]: Script error.
Message: error:http://cdn.dynatrace.com/blog/wp-includes/js/prototype.js?ver=1.6.1[4821] Code: 0: Object doesn't
Message: error:http://cdn.dynatrace.com/blog/wp-includes/js/prototype.js?ver=1.6.1[4621] Code: 0: Object doesn't
Message: error:http://munchkin.marketo.net/munchkin.js[28] Code: 0: Object doesn't support this property or metho
Message: error:http://munchkin.marketo.net/munchkin.js[20] Code: 0: Object doesn't support this property or metho
Message: http://twitter.com/statuses/user_timeline/dynatrace.json?callback=twitterCallback2&count=5[1]: Error loa
Message: http://connect.facebook.net/en_US/all.js[1]: Error loading script
Message: http://twitter.com/javascrip/blogger.js[1]: Error loading script
Message: error:http://connect.facebook.net/en_US/all.js[1] Code: 0: Syntax error

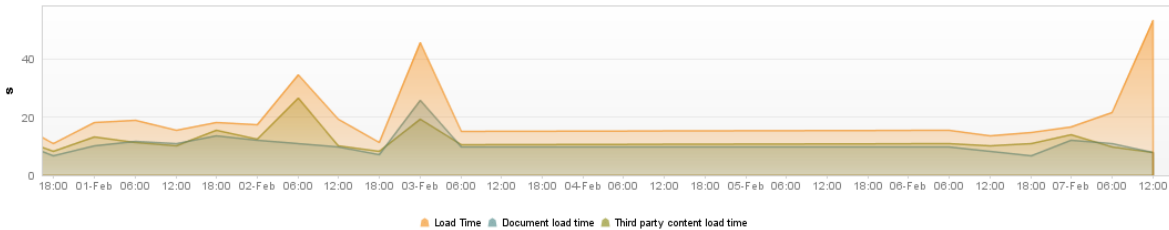
Page Action Error Hotspots

Message	Count
Title: How to avoid the Top 5 SharePoint Performance Mistakes Application Performance, Scalabi	169
Title: About the Performance of Map Reduce Jobs Application Performance, Scalability and Archi	160
Title: Understanding Caching in Hibernate – Part One : The Session Cache Application Performanc	77
Title: Application Performance, Scalability and Architecture – The dynaTrace Blog	69
Title: Do you need to monitor your Mobile App? Application Performance, Scalability and Archite	68
Title: Understanding Caching in Hibernate – Part Two : The Query Cache Application Performance	61
Title: Understanding Caching in Hibernate – Part Three : The Second Level Cache Application Perf	56
Title: How Garbage Collection differs in the three big JVMs Application Performance, Scalability a	55
Title: Lazy vs. Eager Loading in Hibernate Application Performance, Scalability and Architecture –	48
Title: The Top Java Memory Problems – Part 1 Application Performance, Scalability and Architect	40

Third Party Content

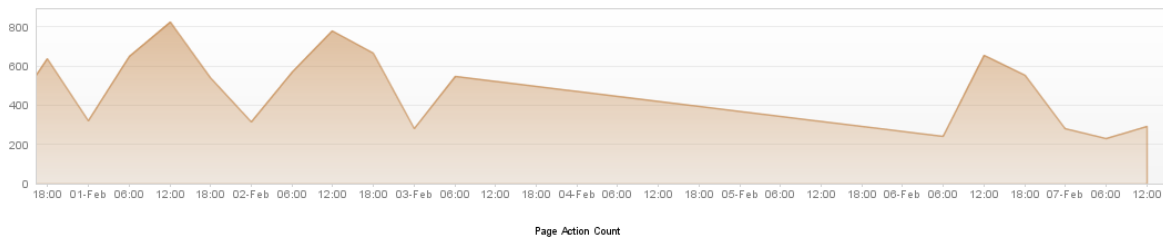
Impact of Third Party Content on Load Time

Shows the correlation of Third Party Times on the time required for loading the initial document as well as the overall page



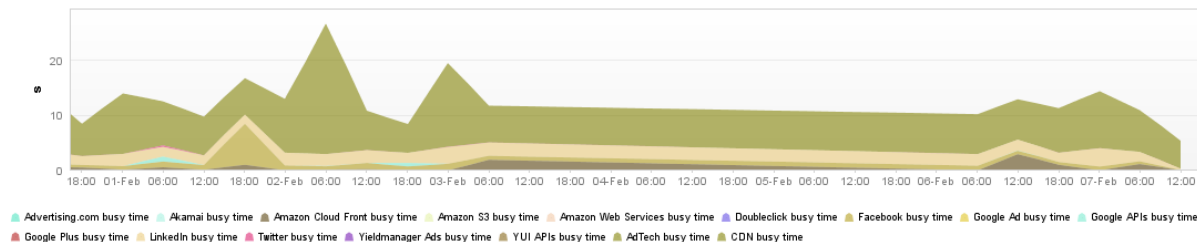
Page Action Trend

Shows the trend of Page Actions over time and helps to correlate response time metrics to load



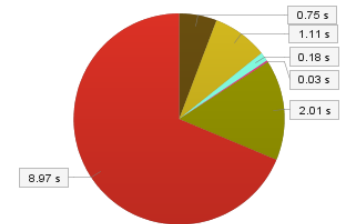
Third Party Time Trend

Shows the time downloading Third Party resources over time and helps to identify potential performance degradations



Impact by Third Party

Shows the time spent downloading resources from Third Parties



- Amazon Cloud Front busy time
- Facebook busy time
- Google APIs busy time
- Twitter busy time
- LinkedIn busy time
- CDN busy time

Third Party Hotspots

Shows critical Third Parties which impact Page Actions the most

Business Transaction		Count
		last 7 days
Page Actions by Third Party		7,803
CDN		4,348
Gravatar		1,871
LinkedIn		1,150
Twitter		213
DZone		91
Facebook		88
Marketo		16
Google Analytics		10
Amazon Cloud Front		7
kundenserver42.de		2
wordpress.com		2
textsrv.com		1
semrush.com		1
urbandictionary.com		1
fbwideo.info		1
blogspot.com		1

Performance Profiling



Visits by Visits

Visits: 56,792 Apdex: 0.92

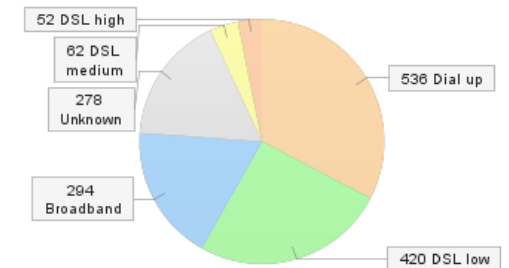
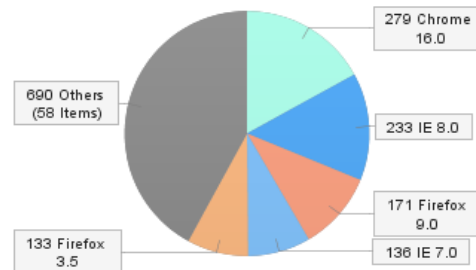
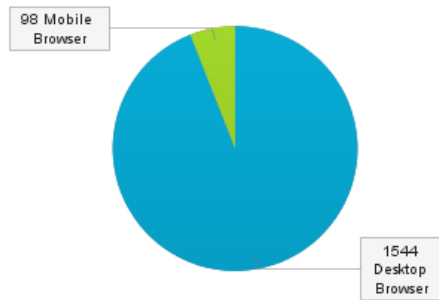
Selecting a single visit shows a detailed view of its page actions.

Visit	Count	Apdex	Page Actions	Visit Durat...	Browser Err...	Failed Actio...	Exit Action failed	Bounce Rate	Visit Tag	Bandwidth
▸ Satisfied Visits	47102	0.96	160430	1min 51s	3 % (1434)	0 % (0)	0 %	40 %	-	-
▸ Tolerating Visits	8048	0.58	13880	53s	11 % (914)	0 % (66)	0 %	73 %	-	-
▸ Frustrated Visits	1642	0.22	2830	3min 40s	20 % (326)	3 % (83)	3 %	76 %	-	-

Client Type

Browser or Device

Bandwidth



Problem Analytics

End User PurePaths

PurePath	Duration [ms]	Apdex Zone	Start Time	Requests	Errors	Location	Browser
click on "Unterkunft"	2654.87	■	2011-06-03 13:05:01.109	1	4	Munich, Germany	Firefox 4.0
Loading of 'Ferienwohnungen Lohbinder (Fam. Holzer), Rottach-Egern ...	7844.00	■	2011-06-03 12:56:36.987	0	4	Reutlingen, Ger...	Firefox 4.0
click on "Ferienwohnungen Lohbinder (Fam. Holzer) Rottach-Egern"	9976.93	■	2011-06-03 12:35:55.038	1	4	Reutlingen, Ger...	Firefox 4.0
Loading of 'Ferienwohnungen Lohbinder (Fam. Holzer), Rottach-Egern ...	9746.07	■	2011-06-03 12:52:55.103	1	3	Reutlingen, Ger...	Firefox 4.0
Loading of 'La Residenza, Milano - Willkommen - Tiscover'	7495.12	■	2011-06-03 12:46:57.403	1	3	Vienna, Austria	Firefox 4.0
Loading of 'La Residenza, Milano - Willkommen - Tiscover'	8624.97	■	2011-06-03 12:45:22.482	1	3	Vienna, Austria	Firefox 4.0
Loading of 'Urlaub Südtirol - Hotel Südtirol, Pension , Ferienwohnung, ...	2828.00	■	2011-06-03 13:12:07.486	0	2	Hamburg, Germ...	IE 6.0
Loading of 'Ferienwohnungen Lohbinder (Fam. Holzer), Rottach-Egern ...	6309.27	■	2011-06-03 12:43:41.990	1	2	Reutlingen, Ger...	Firefox 4.0
Loading of 'Wanderotel, Schweiz - Mitgliedsbetriebe - Tiscover'	5211.34	■	2011-06-03 12:41:19.989	1	2	Herzogenrath, G...	Firefox 4.0
Loading of 'Bad Wiessee, Bayern, - Hotel, Pension, Ferienwohnung, Unt...	3116.37	■	2011-06-03 12:34:04.100	1	2	Herzogenrath, G...	Firefox 4.0
click on "Unterkünfte suchen"	8879.28	■	2011-06-03 13:20:10.500	1	2	Reutlingen, Ger...	Firefox 4.0
click on "Deutschland"	5258.29	■	2011-06-03 13:20:04.100	1	2	Reutlingen, Ger...	Firefox 4.0
click on "fit0_0"	12293.72	■	2011-06-03 13:19:18.400	1	2	Reutlingen, Ger...	Firefox 4.0
click on "Unterkünfte suchen"	9739.99	■	2011-06-03 13:19:09.100	1	2	Reutlingen, Ger...	Firefox 4.0
click on "Suchen"	4609.90	■	2011-06-03 13:19:00.100	1	2	Reutlingen, Ger...	Firefox 4.0
click on "fit1_10"	10990.35	■	2011-06-03 13:18:07.400	1	2	Reutlingen, Ger...	Firefox 4.0
click on "fit1_9"	11004.91	■	2011-06-03 13:17:56.400	1	2	Reutlingen, Ger...	Firefox 4.0
click on "Unterkünfte suchen"	12158.16	■	2011-06-03 13:17:43.100	1	2	Reutlingen, Ger...	Firefox 4.0

PurePaths Contributors Errors and Warnings

Method	API	Total [ms]
action(click on "Unterkunft", click)	End User Action	376344.87
Action continues on a different page		-
Page /de/portal/accommodation/5,de,OADV/objectId,ACC107121de,m		-
loading of page 'Ferienappartement Friederike Hagn, Kreuth - Willk	End User Action	3020.00
Browser Error	Browser Error	0.00
Browser Error	Browser Error	0.00
Browser Error	Browser Error	0.00
Browser Error	Browser Error	0.00
Web Requests		-
Web Request(200) /de/portal/accommodation/5,de,OADV/ot		148.63
onload handler executions of page 'Ferienappartement Friederik	End User Action	127.00

Node Details

Method: Browser Error
 Class: -
 Argument: http://www.tiscover.com/de/script/libs/pobject/persist.swfobject-2.2.js[1]: this.el.get is not a function
 Return: -
 Agent: Browser (JavaScript)@cloud:0
 API: Browser Error
 Thread Name: -
 Elapsed Time [ms]: -

Virtualization Suspension Time Details

Time Details	Total	Exec	%
Execution Time [ms]:	0.00	0.00	0.00
Execution CPU Time [ms]:	-	-	0.00
Sync Time [ms]:	-	-	-
Wait Time [ms]:	-	-	-
Runtime Suspension Time [ms]:	-	-	-

End-User Problem Details

Error: this.el.get is not a function
 File: http://www.tiscover.com/de/script/libs/pobject/persist.swfobject-2.2.js
 Line: 1
 Session: 1C67A682289545B81744805884AD4238
 Page-ID: G_1307099118861
 URL: http://www.tiscover.com/de/portal/accommodation/5,de,OADV/objectId,ACC107121de,moduleId,scout,parentId,RGN5684de,season,at1_selectedEntry,home/home.html
 Title: Ferienappartement Friederike Hagn, Kreuth - Willkommen - Tiscover
 User-Agent: Mozilla/5.0 (Windows NT 6.1; rv:2.0.1) Gecko/20100101 Firefox/4.0.1

Copy Selected Copy All Close

Tree Transaction Flow API Distribution

Performance Bookmarklet

Bookmarklet for Navigation Timing

Drag the [TimingsReader](#) link to your bookmarks bar and try it out

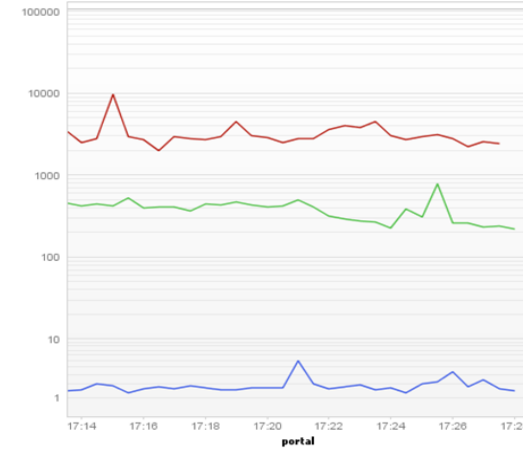
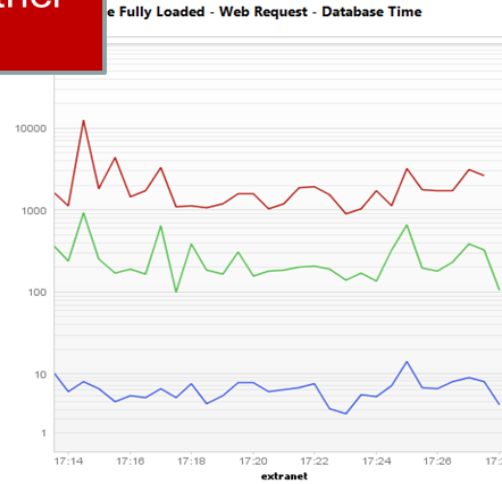
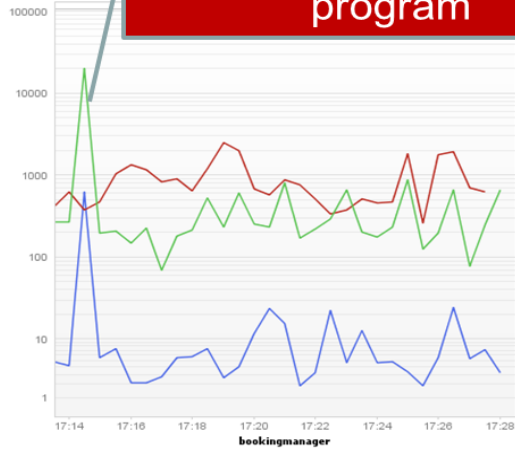
This is what it will look like in your browser. (Click on it to make it disappear)



<http://blog.dynatrace.com/samples/bookmark.html>

Breakdown 2 – User, Server, DB

Internal call from another program



Measure	C..	Aggregation	Unit	Show Thresholds
Database Time (split by Application)		Average	ms	<input type="checkbox"/>
Page Action FullyLoaded (split by Application)		Average	num	<input type="checkbox"/>
Web Request ServerTime (split by Application)		Average	ms	<input type="checkbox"/>

Page Fully Loaded
 Web Request Response Time
 Database Time

Database Time
 Web Request Response Time
 Page Fully Loaded

Measure	C..	Aggregation	Unit	Show Thresholds
Database Time (split by Application)		Average	ms	<input type="checkbox"/>
Page Action FullyLoaded (split by Application)		Average	num	<input type="checkbox"/>
Web Request ServerTime (split by Application)		Average	ms	<input type="checkbox"/>

about:performance
Application Performance, Scalability and Architecture

Web Cloud Dev Ops Mobile Automation Tuning

Application Performance, Scalability and Architecture

Keywords...

15 Feb **Specification Proposal for JavaScript Timing in Browsers**
This proposal defines a potential future standard as an addition to those currently developed by the W3C Web Performance Working Group. It's goal to gain visibility into JavaScript execution via a browser provided API accessible via JavaScript. Motivation Current specifications of the Web Performance Working cover page loading related metrics. They however lack insight the [...]
Alois Reitbauer General No comments yet.

13 Feb **The Super Bowl Effect on Website Performance**
Whether you are a Fan of US Football or not – It was really hard to avoid this huge sport event on February 5th. Besides the actual game it is the Super Bowl commercials that – besides being very expensive to air – usually drive a lot of load on the websites of the companies [...]
Andreas Grabner Architecture and Performance, General, JavaScript/AJAX No comments yet.

9 Feb **Cloud Connect Santa Clara 2012**
The Cloud Connect in Santa Clara starts on Monday, 13th of February. I will be there Tuesday and Wednesday at the dynaTrace booth. I will also talk about Performance SLAs in the Cloud. If you are there, make sure to drop by our booth for a chat and personal dynaTrace demo. see you there, Michael [...]
Michael Kopp Virtualization/Cloud No comments yet.

7 Feb **dynaTrace AJAX Edition 3.5 with Beta support for Internet Explorer 10 and Firefox 10**
With the new release of the dynaTrace AJAX Edition you have Beta support for the Firefox 10 browser and therefore you can test the performance of your Web sites with the latest available Browsers from Mozilla and Microsoft. The new dynaTrace AJAX Edition also helps you to prepare yourself for the future. With the support [...]
Klaus Enzenhofer General No comments yet.

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Share 14

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Learn more about our authors

dynaTrace Twitter Updates

New
dynaTrace 4
The New Generation of APM

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AJAX 3
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Blogroll
Application Performance Matters
C-Power – Compuware Ventures
Community Clicks
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@AloisReitbauer

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