Insights from the RUM Archive

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@programmingart
A public **dataset** of anonymized Real User Monitoring (RUM) measurements.

www.rumarchive.org
What?

Filtered
Data from top 100 customers

Anonymized
URLs and other PII stripped

Aggregated
Combine data in fewer rows with histograms

https://rumarchive.com/datasets/
https://rumarchive.com/docs/methodology/
https://www.akamai.com/products/mpulse-real-user-monitoring
<table>
<thead>
<tr>
<th>Page Loads</th>
<th>Third party resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Date</td>
</tr>
<tr>
<td>DeviceType    DeviceModel    OS ...</td>
<td>DeviceType    DeviceModel    OS ...</td>
</tr>
<tr>
<td>UserAgent    UserAgentVersion</td>
<td>UserAgent    UserAgentVersion</td>
</tr>
<tr>
<td>Country</td>
<td>Country</td>
</tr>
<tr>
<td>DNS  TCP  TLS  TTFB ...</td>
<td>DNS  TCP  TLS  TTFB ...</td>
</tr>
<tr>
<td>Landing page  NavigationType ...</td>
<td>AssetType    InitiatorType ...</td>
</tr>
<tr>
<td>FCP  LCP  CLS  FID  TBBT  INP  BBQ ...</td>
<td>ResponseTime DownloadTime ...</td>
</tr>
<tr>
<td>RageClicks</td>
<td>DecodedSize TransferSize ...</td>
</tr>
</tbody>
</table>

Top 100 customers  
~200 million daily beacons

500 most common  
~160 million daily beacons

https://rumarchive.com/datasets/
Why?

Be **complementary** to other **popular** datasets:

<table>
<thead>
<tr>
<th>Synthetic</th>
<th>VS</th>
<th>Real Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single browser</td>
<td>VS</td>
<td>Cross-browser</td>
</tr>
</tbody>
</table>

(Both great for comparing yourself to others)
How?
Some gotchas when querying directly

AND BEACONTYPE = 'page view'
AND USERAGENTFAMILY = 'Firefox'
AND DEVICETYPE = 'Mobile'
GROUP BY COUNTRY
ORDER BY SUM(BEACONS) DESC

I do get data for Chrome and Safari using the same query, but none for Firefox or Opera

Nov 6, 2023, 9:03 PM

I think the Firefox useragent is called "Firefox Mobile" on Android/most others and "Firefox iOS" on iOS

https://rumarchive.com/docs/tables/
Operating System

The following graphs show the usage of different Operating Systems for Desktop and Mobile devices (OSes with < 1% usage share have been filtered out).

Timeseries of Desktop Operating System

Timeseries of Mobile Operating System

Browser

The following charts show the usage of different Browsers / User Agents for Desktop and Mobile devices (entries with < 1% usage share have been filtered out). The data shown is from December 1st 2023.

How?
RUM Insights

https://rumarchive.com/insights/
Still not great for Firefox on Mobile, sorry :(

Desktop browsers

- Chrome: 67.3%
- Edge: 16.9%
- Safari: 8.7%
- Firefox: 5.3%
- IE: 1.0%
- Apple Mail: 0.7%

Mobile browsers

- Mobile Safari: 33.4%
- Chrome Mobile WebView: 17.6%
- Chrome Mobile: 20.3%
- Mobile Safari UI/WKWebView: 14.8%
- Chrome Mobile iOS: 3.2%
- Facebook: 3.1%
- Samsung Internet: 3.0%
- Google: 2.8%

Not showing entries < 1%

https://rumarchive.com/insights/
INSIGHTS
Device Types fluctuate very heavily?

Sep 1, 2022 → Dec 1, 2023

58% MOBILE
38% DESKTOP
4% TABLET
Temporal Interference

Showing data for only the 1st of the month

Why? Querying for all the dates is too expensive :(
First day vs First Tuesday

58% MOBILE
38% DESKTOP
4% TABLET

58% MOBILE
38% DESKTOP
4% TABLET
The RUM Archive is biased towards mobile + iOS

71% WINDOWS
25% MAC OS
62.5% iOS
37.5% Android
Contrary to global sales...

Global Smartphone Sales Share by Operating System

81% Android
53% Android
16% iOS
47% iOS

(Australia 2023)

https://infrequently.org/2024/01/performance-inequality-gap-2024/
Core Web Vitals: Chromium vs CrUX vs iOS

Desktop Browsers
- Chrome (CWV + CrUX): 67.4%
- Chromium (CWV, no CrUX): 17.9%
- Firefox: 5.0%
- Safari: 8.5%
- Others: 1.2%

Mobile Browsers
- Chrome (CWV + CrUX): 34.3%
- Webkit (Others, no CWV): 3.0%
- Webkit (Safari, no CWV): 52.9%
- Others: 7.2%
- Chromium (CWV, no CrUX): 2.6%

62.5% iOS vs 37.5% Android
Might improve (in EU)?

Apple (has) to start allowing other browser engines!

Using alternative browser engines in the European Union

iOS 17.4 introduces new capabilities that let iOS apps use alternative browser engines — browser engines other than WebKit — for dedicated browser apps and apps providing in-app browsing experiences in the EU. To use an alternative browser engine in your app, you’ll need to request the Web Browser Engine Entitlement (for browser apps that want to use alternative browser engines) or the Embedded Browser Engine Entitlement (for apps that provide in-app browsing experiences that want to use alternative browser engines).

Apple will provide authorized developers access to technologies within the system that enable critical functionality and help developers offer high-performance modern browser engines. These technologies include just-in-time compilation, multiprocess support, and more.

We can still compare non-CWV across browsers!

DNS  TCP  TLS  TTFB  Redirect  RTT

Pageload time  First Contentful Paint  Rage clicks

SOON™

https://colab.research.google.com/drive/1FtOrwJzOkd-qXM5fuTsTj0MZpFckC5iq
https://docs.google.com/presentation/d/1Euu4FBFL75z0I8UtKf3dTzrLYu6wxfeWnrmXUCn9AQIY
**LCP in Firefox vs Chrome (Desktop)**

Only enabled by default in FF v122, went stable on Jan 23 2024

<table>
<thead>
<tr>
<th>Jan 23 - 31</th>
<th>752</th>
<th>1297</th>
<th>2243</th>
<th>3809</th>
<th>5462</th>
</tr>
</thead>
<tbody>
<tr>
<td>p25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p50</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>p75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p90</td>
<td></td>
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<td></td>
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<tr>
<td>p95</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 13 million</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jan 23 - 31</th>
<th>793</th>
<th>1368</th>
<th>2383</th>
<th>4139</th>
<th>6049</th>
</tr>
</thead>
<tbody>
<tr>
<td>p25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td>p90</td>
<td></td>
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</tr>
<tr>
<td>p95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 238 million</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Similar trend for Firefox Mobile vs Chrome Mobile
What about Interaction to Next Paint?!?

INP over time (10P, 25P, 50P, 75P, 95P)

Duration: 645

mPulse by Akamai

INP (ms)

01/13/2024 01/15/2024 01/17/2024 01/19/2024 01/21/2024 01/23/2024 01/25/2024

01/23/2024

95 650ms ± 0.465
75 43ms ± 0.465
50 26ms ± 0.465
25 19ms ± 0.465
10 13ms ± 0.465
## 3rd party resources

<table>
<thead>
<tr>
<th>Rank</th>
<th>Source</th>
<th>FETCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Google Tag Manager (gtm)</td>
<td>16%</td>
</tr>
<tr>
<td>3</td>
<td>Facebook tracking pixel</td>
<td>5.3%</td>
</tr>
<tr>
<td>4-7</td>
<td>Google Analytics</td>
<td>20.82%</td>
</tr>
<tr>
<td>8</td>
<td>Google Ads (doubleclick.net)</td>
<td>2.35%</td>
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<tr>
<td>9</td>
<td>Akamai mPulse</td>
<td>1.98%</td>
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<tr>
<td>10</td>
<td>Bing Ads</td>
<td>1.81%</td>
</tr>
<tr>
<td>11-20</td>
<td>Pinterest, tiktok, Amazon Ads, Adobe</td>
<td>10.08%</td>
</tr>
<tr>
<td>21-22</td>
<td>Google Fonts</td>
<td>1.8%</td>
</tr>
<tr>
<td>23-97</td>
<td>Snapchat, criteo, youtube, twitter, linkedin</td>
<td>a lot</td>
</tr>
<tr>
<td>98</td>
<td>First cookie consent manager (Trustarc)</td>
<td>0.14%</td>
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<tr>
<td>98</td>
<td>First cookie consent manager (Trustarc)</td>
<td>0.14%</td>
</tr>
<tr>
<td>495</td>
<td>jQuery mousewheel plugin (cdnjs)</td>
<td>0.01%</td>
</tr>
</tbody>
</table>
### 3rd party resources: Caching and Sizes

<table>
<thead>
<tr>
<th></th>
<th>Cache hits Dec 31</th>
<th>Transfer size Dec 31</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cache hits</strong></td>
<td>1.8%</td>
<td>343 bytes</td>
</tr>
<tr>
<td><strong>p50</strong></td>
<td></td>
<td><strong>p50</strong></td>
</tr>
<tr>
<td><strong>p90</strong></td>
<td></td>
<td><strong>7.7KB</strong></td>
</tr>
<tr>
<td><strong>p95</strong></td>
<td></td>
<td><strong>42KB</strong></td>
</tr>
<tr>
<td><strong>p99</strong></td>
<td></td>
<td><strong>131KB</strong></td>
</tr>
<tr>
<td><strong>Transfer size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p50</strong></td>
<td></td>
<td><strong>p50</strong></td>
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<tr>
<td><strong>p90</strong></td>
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<td><strong>p90</strong></td>
</tr>
<tr>
<td><strong>p95</strong></td>
<td></td>
<td><strong>p95</strong></td>
</tr>
<tr>
<td><strong>p99</strong></td>
<td></td>
<td><strong>p99</strong></td>
</tr>
</tbody>
</table>

**Smallest:** www.facebook.com/tr/ @ 185 bytes x 333k loads

**Largest:** securepubads.g.doubleclick.net/.../pubads_impl.js @ 131 KB x 264k loads
The EverGreen/Self-Updating browser: Chrome

Chrome

Sep 5, 2022 → Dec 18, 2023

Chrome Versions (%)

Nov '22 | Jan '23 | Mar '23 | May '23 | Jul '23 | Sep '23 | Nov '23

70% v120
12% v119
2% v118
The EverGreen/Self-Updating browser: Firefox

v115 is ESR (Extended Support Release)
The Laggard: Safari

Sep 5, 2022 → Dec 18, 2023

43.6% v17
34.3% v16
13.9% v15
5.3% v14
The Work Hard/Play Hard UA: Facebook

Oct 1, 2021 → Dec 1, 2023
Per-site RUM vs Aggregated RUM

Navigation Types (MPA)

- Navigation: 85%
- Back-Forward: 14%
- Reload: 1%

Desktop

- Navigate: 89.9%
- Reload: 4.2%
- Back/Forward: 5.9%

Mobile

- Navigate: 89.1%
- Reload: 2.6%
- Back/Forward: 8.3%
Multi- VS Single-Page Apps : challenging assumptions

Desktop

SPA (soft): 20.4 %
SPA (hard): 20.5 %
MPA: 59.1 %

Mobile

SPA (hard): 19.2 %
SPA (soft): 21.4 %
MPA: 59.4 %

https://rumarchive.com/insights/
Page load HTTP versions over time

- 74.5% HTTP/2
- 20.8% UNKNOWN
- 3.1% HTTP/1
- 1.6% HTTP/3

https://github.com/rum-archive/rum-insights-data
https://github.com/rum-archive/rum-archive/issues/24
3rd party resources HTTP versions over time

<table>
<thead>
<tr>
<th>Row</th>
<th>protocol</th>
<th>rowcount</th>
<th>fetchcount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>null</td>
<td>34590773</td>
<td>4768736846</td>
</tr>
</tbody>
</table>

https://github.com/rum-archive/rum-insights-data
https://github.com/rum-archive/rum-archive/issues/24
HTTP/3 support seen in other datasets

https://radar.cloudflare.com/
https://httparchive.org/reports/state-of-the-web
It’s the RUM Archive, not the mPulse Archive
Simple query to go from mPulse to RUM Archive

```sql
SELECT * FROM mPulse
WHERE beacon_count >= MIN_BEACON_COUNT;
```

https://rumarchive.com/contribute/
RUM Archive

www.rumarchive.org

Now open for business!
Come get some!