Towards an Open, Web-Based Network Performance Measurement Platform

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DevOps ♥ JavaScript

- JavaScript: The duct tape of the Internet
  - JavaScript for web performance measurements?
JavaScript for Web Performance

- W3C Web Performance Working Group
  - `PerformanceResourceTiming` API
  - Allows JavaScript mechanisms to provide complete client-side latency measurements
JavaScript for Web Performance

• Example

```javascript
// Resource Timing
var r0 = performance.getEntriesByType("resource")[0],
    loadtime = r0.duration,
    dns = r0.domainLookupEnd - r0.domainLookupStart,
    tcp = r0.connectEnd - r0.connectStart,
    ttfb = r0.responseStart - r0.startTime;
```

• accurate delay (and throughput) measurements
JavaScript for Web Performance

- Deployment and browser support

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Use Cases

- **3rd party pixel tags**

- **Beacon: W3C Web Performance Working Group**
  - schedule asynchronous and non-blocking delivery
  - minimizing resource contention with other time-critical operations

* Use Timing-Allow-Origin Response Header
Commercial JavaScript Based Web Performance Analytics
Towards an Open Web Performance Measurement Platform

- Design and deployment experience with a CDN

- **Clients:** Use JavaScript to crowdsource network performance measurements
  - Recruit content providers to invoke client measurements
  - Or...

- **Servers:** Sufficient measurement web servers
  - M-LAB
  - perfSONAR
  - Ark
  - RIPE Atlas
  - Cloud instances
Towards an Open Web Performance Measurement Platform
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Technical & Non-technical Issues

• Incentives for web publishers to participate
  – Open API

• Control framework and use cases
  – How many servers to contact?
  – Which servers to contact?

• IRB issues
  – consent
  – anonymization
  – aggregation