A new kind of analytics: Actionable Performance Analysis

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Something about me

✓ Developer turned entrepreneur
✓ 20+ years high-tech
✓ Love solving technical challenges
✓ Co-founder Nouvola

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The Why of Performance
Why Performance?

You should know speed is product feature number 1

- Larry Page, Google founder, quoted by Urs Hölzle at Velocity conference

People will visit a Web site less often if it is slower than a close competitor by more than 250 milliseconds


Sources:
http://www.bookofspeed.com/chapter1.html
http://www.nytimes.com/2012/03/01/technology/impatient-web-users-flee-slow-loading-sites.html?pagewanted=all

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WHY?

- Higher conversion rate
- Increase visibility
- Revenue growth
- Resource optimization
- Brand loyalty
- Costs reduction

NOUVOLA
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Performance and DevOps
DevOps and performance

- Cloud complexity
- Software stack
- Cloud infrastructure
DevOps and performance

✓ Has become part of the cloud challenge
✓ Focus on non functional testing
What to do?
In God we Trust,
for everybody else:
Give me data
Data or...

Deploy and Pray?
Different types of data

Preproduction / Staging

Synthetic traffic

Performance testing

Deploy

Live

Monitoring
Many types of monitoring

<table>
<thead>
<tr>
<th>Stack monitoring</th>
<th>NewRelic AppDynamic</th>
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<tbody>
<tr>
<td>Infrastructure monitoring</td>
<td>CloudWatch</td>
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<td>Logs aggregation</td>
<td>Loggly, CloudTrail</td>
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<td>User behavior</td>
<td>Splunk, ElasticSearch</td>
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<tr>
<td>High frequency metrics</td>
<td>SignalFX</td>
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</table>

And many more…
Monitoring is not enough
Monitoring is not enough

• Live traffic is noisy

• Hard to troubleshoot, don’t know what the users are going to do

• After the fact
“Monitoring is like calling AAA after the accident. You need to prevent the accident instead.”
Pair up monitoring with performance testing

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Different types of data

- Preproduction / Staging
- Synthetic traffic
- Performance testing

→

- Deploy
- Live
- Monitoring
Performance testing

• Users simulated but traffic is real (synthetic)
• Total control over amount of traffic and user scenarios / workflows
• End-to-end user metrics – KPI for the user experience
What to test

✓ Realistic scenarios
✓ Any load, any device, any geo
✓ End-to-end User experience

GOAL: predict what is going to happen
What to measure

- User performance metrics
- End to End response timing
- Throughput: number of successful requests
- Error rate

GOAL: resolve issues before deployment
When do you test?
Still not enough
• My tests are telling me that when I have 10,000 concurrent users (/sec) on my platform, the response time deteriorates from 400ms to 2.5s
Great 😞
Performance troubleshooting

~40 % time
Reproducing

~40% time
Isolating

~20% time
Fixing

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Path to Remediation

Close the feedback loop: from identifying the issue to fixing the problem

Before testing → Test results: Reproduce and Detect performance issues → Performance Analytics: localize bottlenecks → Remediation: Fixing → SOLUTION

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Predictive Performance Analytics
Predictive Performance Analytics

**Objective:**
Identify leading indicators of performance issues
Accelerate troubleshooting process
Get actionable data
Predictive Performance Analytics

Perf Testing + Data Instrumentation + Machine Learning
General description

• Increase in traffic causes an increase in response time, statistically relevant.
• The contribution of external parameters: network, DNS time, etc. is checked.
• Out of the thousands and thousands of available metrics, only those with statistically meaningful variations are considered.
• Relevant metrics are clustered per sector if possible and critical threshold of traffic is evaluated using data analysis / mining approach.
Data Analysis

• Machine learning / data mining
• Clustering
• Longitudinal analysis
See it in Action
Web application

- id: "658"
- virtual_users: "1000"
- name: "DC 1000 LR"
- traffic_model: "0"
- duration: "10"
- uris: "\{Transaction A\}"
- user_id: "42"
- run_count: "2"
- run_last: NA
- created_at: "2014-10-11 06:26:32"
- updated_at: "2014-10-13 17:14:25"
- data_center: "1"
- credential_id: "30"
- user_session_id: "146"
Perf test results

AVERAGE RESPONSE TIME

Response Time (msec)

Test Duration (sec)

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## Data Instrumentation

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<tr>
<td>Application Stack</td>
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Results -2

AJAX

BROWSER

DATABASE

APP STACK

SRV&SW

PREBACKEND

 Regular

 T-zone

 Over
Summary

✓ Speed is product feature number 1

✓ Performance testing complements well monitoring techniques

✓ Performance testing is still not enough

✓ Perf test + data instrumentation + machine learning = predictive performance analytics

✓ See it in action
Thank You!

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