15 years of APM – Why applications still struggle with performance problems

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About me

Consultant at NovaTec Consulting
11 years experience as performance engineer
Responsible for the APM consulting portfolio
Project lead for inspectIT and loadIT
Top performance problems
... they did not change too much in the last years

Compiled from NovaTec experience

See also:
http://apmblog.compuware.com/2013/04/10/top-8-application-performance-landmines/

- Too many database calls
- Bad SQL queries
- Missing database optimizations
- Chatty services
- Unnecessary service calls
- Configuration
- Memory / GC
- Synchronized
- Too many Ajax calls
- Inperformant Javascript
- Bloated Webfrontends

… they did not change too much in the last years
Is it bad tool support?
APM Tool Market

“traditional” system management tools extended by APM features

Innovative Startups became leaders in a few years

New contenders: Bluestripe, Extrahop, Confio, VMware

Big companies “swallow” innovators to improve their offerings

As of August 2012
Features of APM solutions

- End user experience
- Architecture discovery
- Transaction profiling
- Component Deep Dive
- Resource Monitoring
- Analytics
Limitations of current APM solutions

- Visualization
- Alerting / Baselines / Anomaly detection
- Staging Support
- Versioning / Auditing
- Collaboration
Visualizations

// Manual vs. Out-of-the-box
// Manual: Very time-consuming and hard to maintain
// Ootb: Hard to extend
// Problem: There is no suitable „middle-way“

// Dynamic dashboards
// conditional visualization (e.g. „show active line“)
// Aggregations options

// Suitable amount of visualiations (graphs)

Summary Statistics

<table>
<thead>
<tr>
<th></th>
<th>Calls</th>
<th>Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load</td>
<td>19.2m</td>
<td>13,303</td>
</tr>
<tr>
<td>Response Time</td>
<td>123 ms average</td>
<td>0.1% 24.8k</td>
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</table>

Response Time Breakdown

- Normal: 99.3% 19.0m
- Slow: 0.4% 75.8k
- Very Slow: 0.3% 63.1k
- Stalls: 0.0% 94

Source: [http://www.appdynamics.com/blog](http://www.appdynamics.com/blog)

Customer Project – done with CA Wily Introscope
Dashboards are built for management not for monitoring

Nobody likes to watch screens all the time
Alerting

Challenge: What are meaningful thresholds

Problems

- **False – Positives**: Angry managers, email floods, war room sessions and all for nothing
  - → Credibility of monitoring sinks

- **False – Negatives**: Angry customers, Angry managers, email floods, war room sessions
  - → Credibility of monitoring sinks

- **Alert floods**
  - People ignore alerts from monitoring if there are too many alerts
Automatic detection of problems

Anomaly detection is still in the early stages

// Baselining on single metrics
  // Quite popular approach, quality of baselines differs greatly
  // Significance of outlier

// Multi-metric correlation
  // Introscope 9.5 bundles Prelert (OEM partnership)
  // Anomalies can be „good“ or „bad“ → added complexity for operating
Staging Support for the APM solutions

- Production
- Training
- Integration
- Test
- Development

Stage specific

Shared

Modification Necessary
Versioning support

Problem:

- Configuration changes can have big impact on the APM solution
- Tools do not provide versioning of the configuration settings

Ray of hope

- Compuware Dynatrace provides an audit.log in the newest version
Can APM solutions find the performance problems?

- Too many database calls: All APM solutions
- Bad SQL queries: Some APM solutions
- Missing database optimizations: No APM solution
- Chatty services: Some APM solutions
- Unnecessary service calls: All APM solutions
- Configuration: Some APM solutions
- Memory / GC: No APM solution
- Too many Ajax calls: All APM solutions
- Inperformant Javascript: No APM solution
- Bloated Webfrontends: No APM solution
What is causing the performance problems then?
Statements that we heard from customers

“We had to skip performance test for this sprint, we had to finish the features”

“Yes sure, performance is important. We already planned a load test 2 weeks before going live”

“I hired highly skilled external developers, they are supposed to write perfect code.”
Statements that we heard from customers

“I did a load test for the application on my machine”

“We are operating, we expect the application to be performance tested.”

“We are just development, that is a task for operating”

“I heard that APM tools are very expensive”
The importance of Performance is still under-rated in most projects!

100 ms latency improvement increases revenue by 1% - 2008

Traffic increases by 9% for every 400ms page load improvement – 2009

1 (2) seconds delay reduce revenue by 3% (5%) - 2010

37-49% of users that experience performance issues will abandon the site or switch to a competitor

32% of consumers will leave a page with load times between 1 and 5 seconds

A user will perceive the time 15% slower than the actual load time and remember that it took 35% longer than it actually did

1) http://blog.gigaspaces.com/amazon-found-every-100ms-of-latency-cost-them-1-in-sales/
3) http://www.techpresentations.org/Performance_Related_Changes_and_their_User_Impact
4) http://www.slideshare.net/stoyan/yslow-20-presentation
Summary

Performance problems did not (drastically) change

Current top performance problems can be found with (nearly) any APM solution

Most performance problems are due to organisation problems
- Wir führen IT-Projekte zum Erfolg -

Vielen Dank für Ihre Aufmerksamkeit!

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