



Master Thesis

# Performance Diagnostics of Rich Internet Applications based on JavaScript or AJAX

in cooperation with  
**dynaTrace software GmbH**

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## Objective

Today's Web Applications contain more and more Code on the Browser side, introducing a wide range of new Performance Problems.

The Objective of this Thesis is to research ways for intercepting the Web Browser User Interface and Web Service calls for the purpose of Performance Measurement, Memory Leak Analysis and Error Diagnosis. The taken Measurements are then related to a new transactional Performance Measurement Approach. A Prototype Implementation needs to validate feasibility of taken Approach.

## Approach

- Research Plug-In Interfaces for popular Web Browsers (Internet Explorer / Firefox)
- Research JavaScript Engines, especially Interfaces for Performance Measurements
- Research different Approaches for JavaScript Instrumentation (Browser Plug-In vs. Instrumentation Proxy vs. server-side Instrumentation)
- Research possibilities to detect JavaScript Memory Leaks
- Research possibilities for Performance Measurements of AJAX Calls (transferred Bytes, Latency, Roundtrip-Time)
- Research Measurement of Rendering Time
- Pick Approach (Plugin / Proxy / Serverside)
- Implement a Prototype

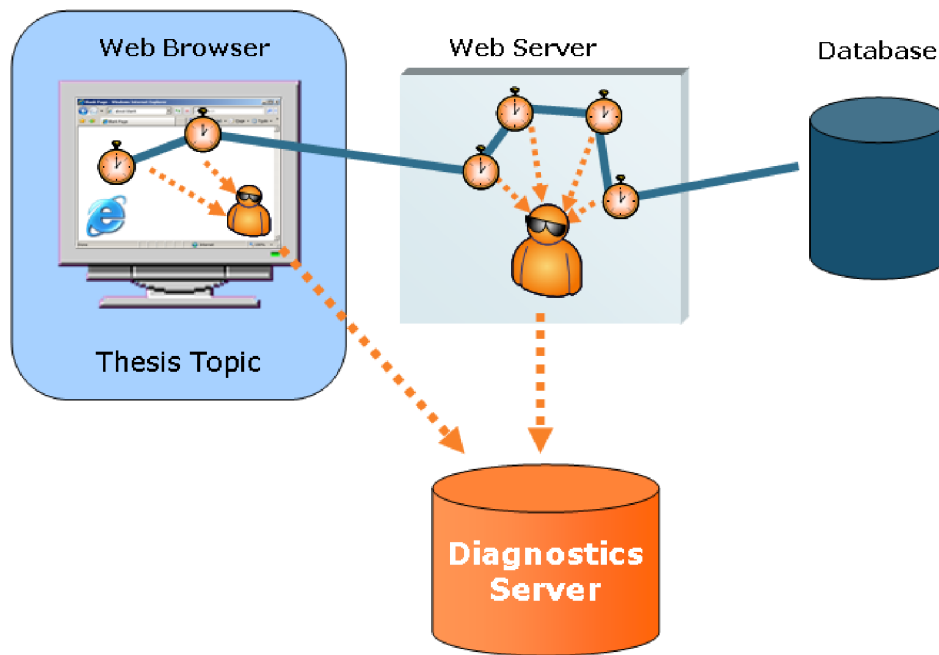


Figure 1: Diagnosing a Rich Internet Application

## Organisation

Your research will be financially rewarded and you get a chance to do most of your work directly at the dynaTrace office in Linz (<http://www.dynatrace.com>). For more information regarding the topic or the organisation of this thesis, feel free to contact [andrea.streicher@dynatrace.com](mailto:andrea.streicher@dynatrace.com)

## References

- [1] *AJAX Logger*  
<https://db.usenix.org/events/lisa07/posters/nakamura.pdf>
- [2] *Flight Data Recorder: Monitoring Persistent-State Interactions to Improve Systems Management*  
<http://research.microsoft.com/~emrek/pubs/FDR-OSDI-CR-FINAL.pdf>
- [3] *Live Monitoring: Using Adaptive Instrumentation and Analysis to Debug and Maintain Web Applications*  
<http://research.microsoft.com/~emrek/pubs/webappmonitoring.pdf>
- [4] *Analyzing Web 2.0 Applications with Ajax View*  
<http://blogs.msdn.com/ie/archive/2007/08/23/Analyzing-Web-2.0-Applications-with-Ajax-View.aspx>
- [5] *JavaScript Memory Leak Detector*  
<http://blogs.msdn.com/gpde/pages/javascript-memory-leak-detector.aspx>