Automated Web Performance Analysis

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Introduction

- Performance is a key feature in many systems nowadays.
- Nowadays → predominant manual analysis
- A system capable of automatically
  - creating a web performance simulation
  - conduct trend analysis of the system under test (SUT)
  - creates an analysis of the SUT → report, pro-active server tuning, performance optimisations
System Under Test (SUT)
Automated Web Performance Simulation

Monitoring Points

Simulation Model
Concept Orientation

- Data Collection
- Simulation
- Prediction
- Management
Potential Chain

1. system starts
2. initial simulation model
3. continuous comparison process
4. adaptation of the simulation
5. reached the claimed accuracy → prediction component
6. analysis of the SUT
Management Component

- Process Chain Control
  - execution of the components
  - optional, pause or terminate components

Data Collection Component

- Monitoring Component
  - Active Software Monitoring
  - Passive Software Monitoring
  - Active and Passive Software Monitoring
Simulation Component

- Model Generation Component
  - Minimum complexity simulation model
  - Average complexity simulation model
  - Maximum complexity simulation model
- Model Comparison Component
- Model Adjustment Component
  - Stepwise
  - Reference Table
  - Random Estimation (MA, AR, ARMA, ARIMA)
Prediction Component

- **Longterm Analysis- and Statistical Component**
  - longterm analysis (MA, AR, ARMA, ARIMA, ...)
  - semantic analysis / trend analysis
  - statistical / mathematical functions

- **Scenario Generation and Execution Component**
  - generates scenarios
  - executes scenarios based on the simulation model
  - reports the results back to the data collection component

- **Reporting Component**
Work Plan/Focus 1/2

- developing a reference architecture supporting automated web performance analysis
  - Is it meaningful when the simulation model and the SUT are confronted with the same requests?
  - Is it practicable to use an automatic adjusting simulation model?
  - Is it possible to adjust the simulation model parameters without interrupting the simulation process?
Work Plan/Focus 2/2

- a prototypical implementation of the architecture, where I intend to integrate existing approaches and tools for subcomponents
  - What type of simulation model should be created?
    - Analytic model
    - Queuing-Network-Model
    - Monte-Carlo-Model

- perform case studies illustrating the suggested approach
Thank you for your attention!