Dagstuhl Seminar „Self-Aware Computing“

Model-driven Algorithms and Architectures for Self-Aware Computing Systems, Jan 18-23, 2015, Dagstuhl Seminar 15041

Organizers

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Community:
http://descartes.tools/self-aware
Dagstuhl Report:
http://drops.dagstuhl.de/opus/volltexte/2015/5038/
Seminar Page:
http://www.dagstuhl.de/15041

Coming soon: Springer Book „Self-Aware Computing Systems“

Springer

Definition

Self-aware Computing Systems are computing systems that:

1. ***learn models*** capturing knowledge about themselves and their environment ***on an ongoing basis*** and

2. ***reason*** using the models enabling them to ***act*** based on their knowledge and reasoning

in accordance with ***higher-level goals***, which may also be subject to change.

S. Kounev, X. Zhu, J. O. Kephart and M. Kwiatkowska, editors. **Model-driven Algorithms and Architectures for Self-Aware Computing Systems** (Dagstuhl Seminar 15041). Dagstuhl Reports, vol. 5, No. 1. pp. 164-196, Dagstuhl, Germany, 2015. http://drops.dagstuhl.de/opus/volltexte/2015/5038

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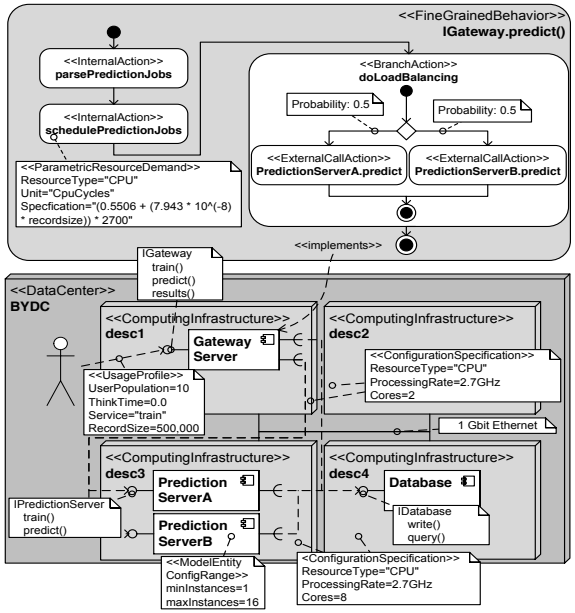
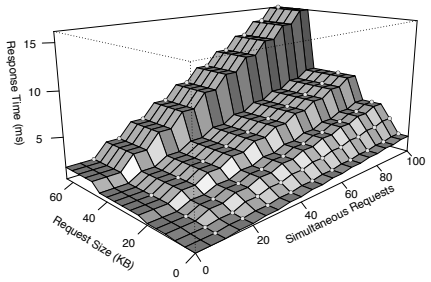
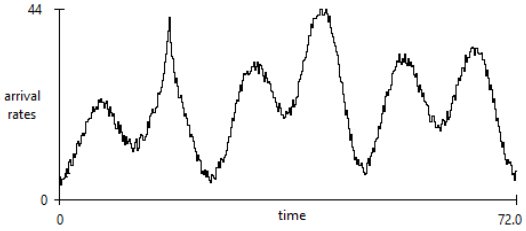
Examples of Models



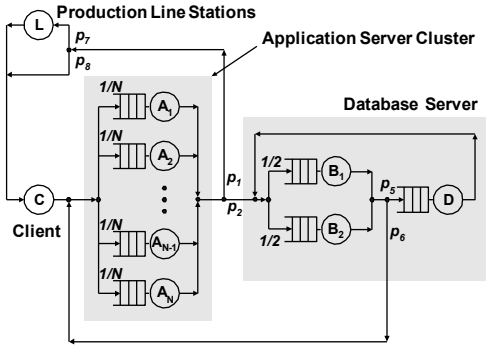
Descriptive MOF-based models



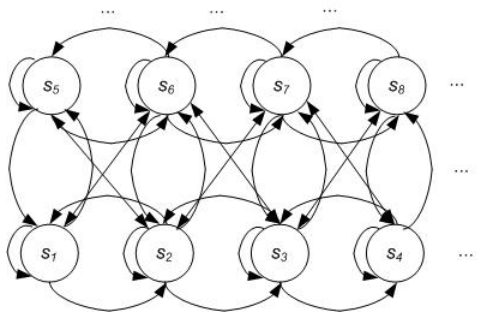
Statistical regression models



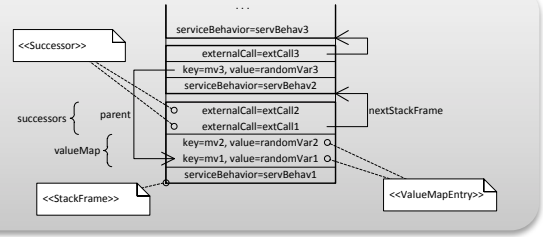
Load forecasting models



Queueing network models



Markov models



Simulation models

$$R \geq \max\left[N \times \max\{D_i\}, \sum_{i=1}^{K} D_i\right] \qquad X_0 \leq \min\left[\frac{1}{\max\{D_i\}}, \frac{N}{\sum_{i=1}^{K} D_i}\right]$$

$$\frac{N}{\max\{D_i\}[K+N-1]} \leq X_0 \leq \frac{N}{avg\{D_i\}[K+N-1]}$$

Analytical analysis models

Self-Aware Learning & Reasoning Loop