Performance issue monitoring, identification and diagnosis of SaaS software: a survey

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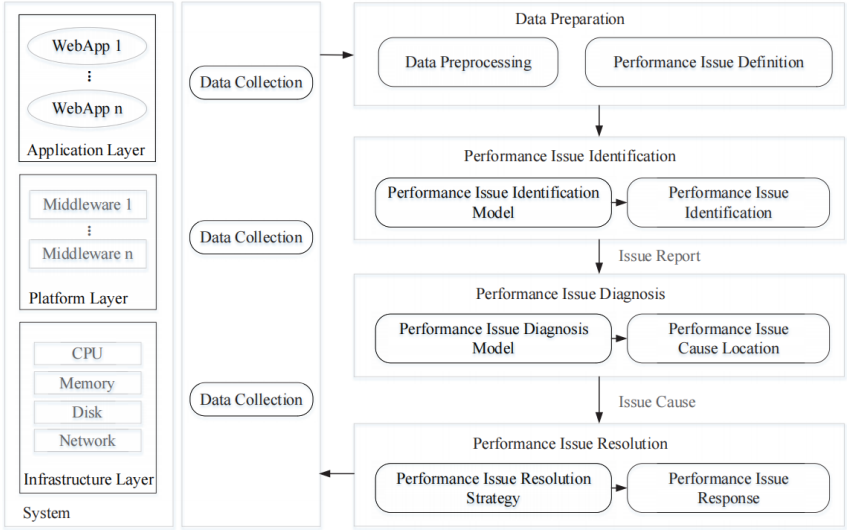
Problems & Ideas

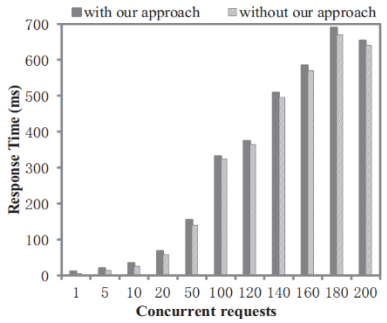
- Problems of performance issue identification and diagnosis:
  - Insufficient information hampers accurate and timely identification and diagnosis of performance issues in SaaS software.
  - Large data volume and complex interactions pose challenges in analyzing log data for performance issue identification and diagnosis.
- Ideas: A comprehensive review of performance issue identification and diagnosis methods for SaaS software, divided into 3 steps: log generation, issue identification, and diagnosis.

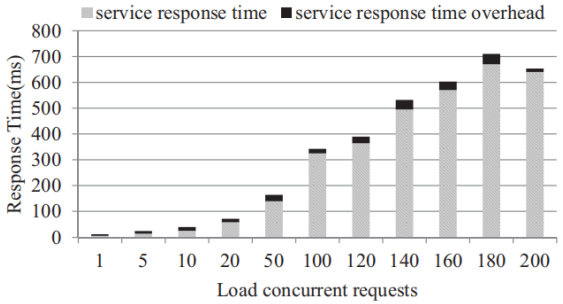


This review explores methods for identifying and diagnosing performance issues in SaaS software, including log generation, issue identification, and diagnosis. Logs provide data for analysis, issue identification determines if performance issues exist, and diagnosis aims to identify the root cause of these issues.

Main Contributions

- Contributions:
  - The method for identifying and diagnosing performance issues in SaaS software is proposed. By targeting specific attributes in performance logs, a systematic approach is provided to analyze and troubleshoot performance issues, leading to improved software performance.
  - The suggestion of using HMRF and RBM to establish recognition and diagnostic models is made. These models leverage advanced machine learning techniques to effectively analyze performance logs and identify potential issues.





Dataset	NB			SVM	KNC	NCC	LR	HMRF
	GaussianNBC	MultinomialNBC	BernoulliNBC					
IDRAS1	0.86	0.69	0.77	**0.90**	0.87	0.88	0.89	0.89
IDRAS2	0.85	0.65	0.78	0.87	0.85	0.84	0.85	**0.90**
IDRAS3	0.86	0.66	0.78	0.89	0.84	0.85	0.86	**0.91**
IDRAS4	0.84	0.70	0.79	**0.88**	0.83	0.84	0.85	**0.88**
IDRAS5	0.83	0.67	0.77	**0.87**	0.85	0.86	**0.87**	**0.87**
AVG.	0.848	0.674	0.778	0.882	0.848	0.854	0.864	**0.89**

Models \ Metrics	Precision	Recall	F1
RBM with ICA	0.88	0.91	0.89
RBM without ICA	0.87	0.90	0.89
GNB	0.86	0.87	0.87
DT	0.84	0.86	0.85
Boosting	0.84	0.87	0.86
ME	0.83	0.86	0.86

The performance and comparison results of the recommended performance issue identification and diagnosis methods. Left: the performance and comparison results of the performance issue identification method; Right: the performance and comparison results of the performance issue diagnosis method.