DBSeer: Pain-Free Database Administration Through Workload Intelligence

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OVERVIEW

Workload intelligence framework for optimized cloud database management

- Improves pricing, tenant isolation, and performance on shared cloud infrastructure
- Applies to database cost management, resource allocation, and performance prediction

BACKGROUND

Cloud computing's shared infrastructure and the decoupling of operators from tenants present new challenges for databases hosted in the cloud. These challenges include pricing database services fairly, ensuring effective isolation of database tenants, and optimizing database performance on shared infrastructure. Historically, virtual-machines have been employed to tackle these issues, but they fall short in addressing the complexities inherent to cloud environments. For instance, virtual machines struggle with fair resource allocation and performance prediction, often leading to inefficiencies and increased costs. As cloud adoption grows, a need exists for advanced methods that can provide accurate predictive models of performance and resource utilization, enabling more efficient database management and better service quality for users.

INNOVATION

Researchers have created a workload intelligence framework named DBSeer that leverages advanced machine learning and causality techniques to enhance database management in cloud environments. This approach utilizes machine learning and statistical regression to identify bottleneck resources and predict performance based on a given set of resources. These predictive models offer precise insights into resource utilization, enabling better pricing, enhanced tenant isolation, and optimized performance. By addressing the core challenges of dynamic, shared infrastructure, DBSeer empowers database administrators (DBAs) with the tools they need to manage cloud databases more effectively. Applications include efficient database cost management, improved resource allocation, and enhanced performance prediction, thereby providing a robust solution to cloud database challenges and improving overall operational efficiency in the cloud.

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