

Test Data as a Service (TDaaS): Automating Test Data Provisioning for Large-Scale Systems

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Abstract: *Efficient and reliable test data provisioning is critical for ensuring the quality of software systems, particularly in large-scale, distributed environments. Traditional test data management techniques are often inadequate in addressing the dynamic needs of modern software development practices, such as continuous integration and delivery (CI/CD), as well as compliance with stringent data privacy regulations. This paper introduces Test Data as a Service (TDaaS), a novel paradigm that reimagines test data management as a cloud-based, automated service. TDaaS leverages scalable architectures, real-time data provisioning, synthetic data generation, and advanced masking techniques to provide secure, compliant, and on-demand test data for diverse testing needs.*

We present a comprehensive framework for implementing TDaaS, emphasizing its seamless integration with CI/CD pipelines, its ability to handle large-scale and distributed testing environments, and its potential to reduce provisioning time while improving data accuracy and scalability. Case studies and quantitative metrics highlight the effectiveness of TDaaS, showcasing its impact on reducing costs, enhancing test coverage, and ensuring regulatory compliance. This paper establishes TDaaS as a transformative approach for test data provisioning, driving efficiency and innovation in modern software quality assurance

Keywords: Test Data as a Service (TDaaS), Test Data Management, Automation, Continuous Integration and Delivery (CI/CD), Synthetic Data Generation, Data Masking, Scalable Testing Frameworks, Cloud-Native Architectures, Privacy Compliance, Software Quality Assurance