

CROSS-PLATFORM DATABASE MIGRATIONS: CHALLENGES AND BEST PRACTICES

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ABSTRACT

Cross-platform database migration involves transferring data and schemas between different database management systems (DBMS), often due to system upgrades, platform transitions, or cost optimization. This process presents numerous challenges, including compatibility issues, data integrity risks, performance concerns, and ensuring minimal downtime during migration. The key challenge lies in differences in data types, indexing methods, and query optimizations across various platforms, which can lead to discrepancies in the behavior of applications post-migration. Moreover, migration can introduce complexities in maintaining application performance, especially when migrating from on-premise databases to cloud environments, or between relational and NoSQL databases.

This paper explores the challenges associated with cross-platform database migrations and outlines best practices to mitigate these issues. It discusses comprehensive planning, including thorough assessment of source and target platforms, data mapping, and schema modifications. Tools and technologies for automating migration, such as data migration software and cloud-based solutions, are also examined. Furthermore, the importance of testing and validation procedures is emphasized to ensure that data integrity and application performance are maintained after the migration. Finally, the paper offers insights into the importance of incremental migration strategies and the necessity of maintaining robust backup and rollback plans to minimize risks. By understanding the underlying challenges and implementing these best practices, organizations can successfully navigate cross-platform database migrations while ensuring data consistency and operational efficiency.

KEYWORDS: *Cross-Platform Database Migration, Data Integrity, Schema Conversion, Performance Optimization, DBMS Compatibility, Cloud Migration, Data Mapping, Migration Tools, Testing and Validation, Incremental Migration, Data Consistency, Backup Strategies*

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