



Migrating Teradata Users to BigQuery

Course description

In this comprehensive technical course, you will learn the essential strategies, methodologies, and practical steps required to successfully migrate users, data, and applications from Teradata to Google BigQuery. This course will cover everything from understanding architectural differences and planning the migration to executing data transfer, translating SQL queries, optimizing performance, and managing post-migration operations. You will gain hands-on experience with tools and techniques for ensuring a smooth transition, maintaining data integrity, and leveraging BigQuery's advanced analytics capabilities. By the end of this course, you will be equipped to design, implement, and manage a robust Teradata to BigQuery migration project within your organization.

- Course level: Advanced
- Duration: 1 day

Activities

This course includes in-depth presentations, practical hands-on labs, live demonstrations of migration tools, group discussion exercises, and real-world case studies.

Course objectives

In this course, you will learn to:

- Evaluate the architectural differences and benefits of migrating from Teradata to BigQuery
- Develop a comprehensive migration strategy, including planning phases, resource allocation, and risk assessment
- Implement robust data extraction, transformation, and loading (ETL/ELT) processes for Teradata data into BigQuery
- Translate complex Teradata SQL and stored procedures into BigQuery-compatible syntax
- Optimize BigQuery schema design, query performance, and cost efficiency post- migration
- Establish secure data governance, access controls, and compliance frameworks in BigQuery
- Integrate migrated data with existing applications and analytical tools
- Troubleshoot common migration challenges and apply best practices for a successful transition

Intended audience

This course is intended for technical professionals involved in data warehousing, analytics, and cloud migration initiatives:

- Database Administrators (DBAs)
- Data Architects
- Data Engineers
- ETL/ELT Developers
- Cloud Solution Architects
- IT Project Managers overseeing data platform migrations
- Business Intelligence Developers

Prerequisites

We recommend that attendees of this course have:

- Strong understanding of SQL and data warehousing concepts
- Experience with Teradata database administration or development
- Basic familiarity with cloud computing concepts, preferably Google Cloud Platform
- Knowledge of scripting languages (e.g., Python) is beneficial but not required

Course outline

Module 1: Introduction to BigQuery and Migration Strategy Overview

- Understanding the BigQuery architecture and core capabilities
- Key motivations for migrating from Teradata to BigQuery (scalability, cost, analytics)
- Overview of common migration patterns and methodologies (lift-and-shift, re- platform, re-factor)
- Assessing the current Teradata environment and identifying migration scope
- Introduction to Google Cloud migration tools and services

Module 2: Teradata Deep Dive and Data Extraction Strategies

- Understanding Teradata architecture: AMPs, BYNET, PDE, Primary Index
- Analyzing Teradata data types, storage mechanisms, and partitioning schemes
- Strategies for extracting data from Teradata: BTEQ, FastExport, TPT, JDBC/ODBC
- Incremental vs. full data extraction considerations
- Data governance and compliance considerations during extraction

Module 3: BigQuery Schema Design and Data Loading

- Translating Teradata schema to BigQuery: data types, partitioning, clustering
- Designing optimal BigQuery tables: denormalization, nested/repeated fields
- Data loading mechanisms for BigQuery: Batch loading (Cloud Storage, bq load), Streaming inserts, Data Transfer Service
- Handling historical data and ongoing data synchronization
- Best practices for data staging and error handling during loading

Module 4: SQL Translation, Query Optimization, and Performance Tuning

- Identifying Teradata-specific SQL constructs and functions
- Tools and techniques for automated and manual SQL translation to BigQuery Standard SQL
- Optimizing BigQuery queries: partitioning, clustering, wildcard tables, join order

- Understanding BigQuery query execution plans and troubleshooting performance bottlenecks
- Cost optimization strategies for BigQuery queries and storage

Module 5: Security, Governance, and Access Control in BigQuery

- Identity and Access Management (IAM) for BigQuery
- Data security best practices: encryption at rest and in transit
- Row-level and column-level security implementation
- Data masking and tokenization techniques
- Auditing and logging for compliance and monitoring
- Data governance frameworks for BigQuery environments

Module 6: Data Pipelines, ETL/ELT Modernization, and Tooling

- Modernizing ETL/ELT pipelines with Google Cloud Dataflow, Dataproc, and Cloud Composer (Airflow)
- Integrating BigQuery with other GCP services: Cloud Storage, Pub/Sub, Looker, Vertex AI
- Utilizing third-party migration and integration tools (e.g., Fivetran, Informatica, Talend)
- Building robust data validation and reconciliation processes
- Handling data quality and data lineage in the migrated environment

Module 7: User Management, Application Integration, and Testing

- Migrating Teradata users and roles to BigQuery IAM
- Re-pointing existing applications and BI tools (e.g., Tableau, Power BI) to BigQuery
- Developing new applications leveraging BigQuery's API and client libraries
- Comprehensive testing strategies: functional, performance, regression, user acceptance testing (UAT)
- Developing a rollback plan and cutover strategy

Module 8: Post-Migration Optimization, Cost Management, and Best Practices

- Continuous monitoring and optimization of BigQuery performance and costs
- Leveraging BigQuery features: BigQuery ML, BI Engine, external tables
- Establishing ongoing operational procedures and support for BigQuery
- Future-proofing your data analytics platform on Google Cloud

- Case studies of successful Teradata to BigQuery migrations and lessons learned

Your course overview ends here.
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