

Teradata Advanced DBA EXAM GUIDE

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INTRODUCTION

- The purpose of this guide is to streamline all the important courses & topics for a candidate who is preparing for the Advanced DBA Exam.
- In short, the aim is to make someone’s life easier, by summarizing all the content at one place & providing a few tips to help in preparation of the Exam.

REVISION HISTORY

- Revision history table shows the changes, and authors who have worked on document.

| Version/Change request number | Version date | Description of changes | Author |
|-------------------------------|--------------|-------------------------------------|--|
| 1.0 | 03/07/2020 | First Draft | Adnan Maskeen/Muhammad Bilal/Mubasher Hassan/Moeiz Bhatti |
| 2.0 | 13/07/2020 | Content Added, Formatting reviewed. | Adnan Maskeen/Muhammad Bilal/Mubasher Hassan/Moeiz Bhatti |

- **Stakeholders**

The below table provides a list of all stakeholders who are interested in this runbook.

| Name | Email | Role |
|------------------|-----------------------------|------------|
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Note: This Guide has been prepared or assembled by Teradata and is intended for informational purposes only and does not guarantee exam success. Some of the information may be dated and may not reflect the most current release. Any opinions expressed in this Guide are the opinions of the individual author.

PREPARATION STRATEGY

- Please keep in mind while preparing that the preparation can be overwhelming.
- If you follow the following tips and tricks you can prepare for the exam in as less as 2-3 weeks even if you do not have as much hands-on experience.

STUDY STRATEGY

- While starting the study, the strategy to be taken should be to take out the objectives and map them to the resource materials
- What people do is start studying from scratch, book by book which is very hectic and time consuming.
- Selective study is key to attempt the exam in a time effective manner.

LEVEL OF STUDY

- We do not need in depth working details of the features at this level of examination. (it may be needed in advance levels).
- The fundamental knowledge like definitions and high-level functionality/features are to be understood for every exam objective.
- Touch each and everything given in the exam objectives and then tally them with the guide we are providing.

EXAM MATERIAL

Orange Books

- Teradata database MAPs Architecture The Basics 2017-07 TDN0009415 - Orange Book
- B035-1099-162K – ResourceUsage
- Teradata Intelligent Memory Teradata
- Block-Level Compression with Selected Enhancements through Teradata Database 16.0
- Load Isolation User Guide Teradata Database 16.00
- TASM TDN0001776
- Teradata Backup Archive Restore DSA Best Practices
- Teradata Row Level Security
- Teradata Secure Zones
- Link to downloading **Orange** books a and other study books is given below

<http://docs.teradata.com/search/books?filters=category~%2522Orange+Book%2522&content-lang=en-US>

WBT & ILT Courses

- ILT 25964 Introduction to the Teradata Database OR WBT 26348 Introduction to the Teradata Database
- ILT 25968 Teradata Vantage Advanced SQL Engine Physical Database Design
- ILT 25969 Teradata Vantage Advanced SQL Engine Physical Database Tuning
- 57040 Teradata Database Administration: Vantage Advanced SQL Engine
- 36916 : Vantage: Optimizing Advanced SQL Engine through Workload Management
- 56941 Teradata Parallel Transporter: Vantage Advanced SQL Engine
- WBT 53054 Teradata Data Stream Architecture (DSA)
- WBT 56458 Teradata Query Grid 2.0 Technical Overview

SAMPLE QUESTIONS

- There are some sample questions at the following link. Go through them once you feel your preparation is done.

<https://www.teradata.com/University/Certification/Vantage-Certifications/Advanced-Developer-Exam> and then click on the "exam prep" tab

IMPORTANT TOPICS FOR EXAM

Listed below are the important topics for the exam. We will cover these in detail as we move forward.

- Compression
- Secure Zone
- Teradata Archive & DSA
- Query Grid
- 3 Tier Security
- Teradata Security
- Data Dictionary Tables
- Teradata Locks
- Complex Data Types
- Row Level Security
- Indexes
- Global Space Accounting
- TD Maps
- Columnar
- Teradata Utilities
- Load Isolation
- Teradata Intelligent Memory
- TASM

COMPRESSION

- Thoroughly read Block level compression (BLC), Multi value compression (MVC) and Algorithmic Compression (ALC).
- Preferred guide to prepare for compression is orange book (**Block-Level Compression with Selected Enhancements through Teradata Database 16.0**)
- DBS parameters with respect to block level compression
- Compare different scenario in which case BLC, MVC or ALC will be applied.
- Study how a combination of multiple compression techniques can be applied.
- How BLC related DBS changes will impact on the compression, e.g. BlockLevelCompression, TempBLCThresh. How their combination work with table level BLC parameters.
- We've attached a guide we've created, that summarizes some key point of compression.



Compression
Methods.docx

SECURE ZONE

- Advantages of secure zone, why it is used and what is different compare to normal Teradata security
- Thoroughly read and understand difference between multiple users/databases involve in secure zone e.g. root, secure zone dba, zone guest, zone member etc
- Study access rights of every user inside & outside the zone.
- We've attached a guide we've created, that summarizes some key point of compression.
- Read different scenarios and implementation of secure zone user cases like Multinational or Conglomerate, Sandbox and Multi-tenancy. These details are discussed in detail within the orange book "Teradata Secure Zones"



SECURE ZONES.docx

Teradata Archive & DSA

- Study the comparison between ARC and DSA.
- While migrating from ARC to DSA how to map ARC full and partition backups to DSA full, delta and cumulative backups.
- Study the different type of backup option in ARC, e.g. AMP Keyword, CLUSTER Keyword, RELEASE LOCK Keyword etc. attached is the document to read ARC options in details.
- Study the difference between DSU and DSE, and DSA different component e.g. DATA STREAM MAIN, DATA STREAM CONTROLLE, DSA NETWORK CLIENT, NETBACKUP

ACCESS MODULE, DD BOOST ACCESS MODULE, AWS S3 ACCESS MODULE, AZURE ACCESS MODULE, DSA GRAPHICAL USER INTERFACE and DSA COMMAND-LINE INTERFACE

- DSA – comparison between FULL, DELTA and CUMULATIVE backups, and while implementing backup with DSA what approach to be followed.
- An example scenario is mentioned in the document attached



BAR Concepts.docx

Query Grid

- Study the components of GQ, and what are required while creating different components, for example (AUTHORIZATION, FOREIGN SERVER, LINKS). Refer to “[Teradata 2.10 QueryGrid Installation and User Guide](#)”
- We’ve attached a document that contain some of the important concepts of Query Grid.



QUERY GRID
CONCEPTS.docx

Tier Security

- **Acquisition:** As the first point of entry into the data warehouse, raw data is acquired from various source systems such as mainframe, server, etc.
- **Integration:** The integration layer is primarily responsible for integrating data from multiple systems both normalized and potentially de-normalized. It also may create common metrics and summaries which are widely used within an organization.
- **Access:** The access layer’s primary responsibility is to provide easy access to the data using various analytic methods.
- How can we secure data between different layers, and while modeling what will be the considerations populating data into different layers

Teradata Security

- For Security, the ppt “[De-mystifying LDAP and SSO Teradata Database External Authentication](#)” by Browning is very important. There also is a WBT on Teradata that covers the same ppt.
- Different mechanisms of authentication in Teradata e.g. Supports 5 pre-defined security mechanisms
 - Teradata Method 1 (TD1)
 - Teradata Method 2 (TD2)
 - LDAP
 - Kerberos (KRB5)
 - SPNEGO
 - IP Filters
- Teradata Generic Security Services (TDGSS) Configuration, read brief details of below mentioned files
 - TdgssLibraryConfigFile.xml
 - TdgssUserConfigFile.xml
 - run_tdgssconfig

Data Dictionary Tables

- All ResUsage table and their structures, should be on your fingertips. The most important are **ResUsage Macros**
- Tables DBC.EventLogs, DBC.SessionInfo and DBS.LogonOff differences and which one is used in case to verify session limits. How to use SessionInfoV for PE analysis
- DBQL tables structure and which is used for forecasting. Scenarios like which columns to identify skewness and PJI etc.
- We’ve created a small document that contains key points of Res Usage Views & Macros. The CPU & AWT ones are really important.



Resource Usage
Logging_Views_Macro

Teradata Locks

- Read in detail about different kinds of locks in Teradata, e.g. Read, Write, Access, Exclusive, Hut
- Difference of locks acquired while access and load isolation lock.
- Scenarios to identify what lock acquired for the specific tables with partition and with and without access locking

- Ready explain plans to identify which SQL is locking how many partitions or locking on row has while accessing or updated data.

| Lock Level | What is Locked |
|------------------------------------|---|
| Database | all rows of all tables in the specified database and their associated secondary index subtables. |
| Table | all rows in the specified base table and in any secondary index and fallback subtables associated with it. |
| View | all underlying tables accessed by the specified view. |
| Partition | the primary and fallback copy of rows in a partition for the specified table or single-table view. The table must be row partitioned. This lock permits other users to access the data in the table that are not in the same partition. |
| PartitionRange | the primary and fallback copy of rows in a range of partitions for the specified table or single-table view. The table must be row partitioned. This lock permits other users to access the data in the table that are outside the specified partition range. |
| RowHash | the specified primary or fallback copy of rows sharing the same row hash value for the specified table or single-table view. For a row-partitioned table, this lock level applies to the row hash value for all partitions. |
| RowHash in a PartitionRange | the specified primary or fallback copy of rows sharing the same row hash value for the specified table or single-table view in a range of partitions. The table must be row partitioned. |
| RowKey | the specified primary or fallback copy of rows sharing the same rowkey (partition and row hash value) for the specified table or single-table view. The table must be row partitioned. A rowkey-level lock permits other users to access other data in the table that do not have the same rowhash or partition value. |

Complex Data Types

- Difference between JSON, BSON and UBJSON.
- For example, which data type is fast for loading and while accessing?
- Document is attached for complex data types as well as a link for macros & functions used for complex data types in Teradata.
- Macros and functions used for complex data types in Teradata.

https://docs.teradata.com/access/sources/dita/topic?dita:mapPath=bgi1512081870828.ditamap&dita:ditavalPath=TD_DBS_16_20_Update1.ditaval&dita:topicPath=nuf1532387510243.dita



JSON, BSON.docx

Row Level Security

- Studying the implementation of RLS is very important.
- Teradata row-level security (RLS) allows you to restrict data access on a row-by-row basis in accordance with your site security policies. Row-level security policies can be used in addition to the standard GRANT privileges to provide a finer level of **access control** to table data
- We've created a document of RLS, that contains the key points.



Teradata Row Level
Security.docx

LOAD ISOLATION

- A feature at DDL level, which permits reading rows during an insert. Only the committed rows are read.
- It is important to review the Orange Book "[Load Isolation User Guide Teradata Database 16.00 2016-05](#)"
- We have summarized some key points of Load Isolation, after reviewing the Orange book mentioned above. The key points are attached below.



LOAD
ISOLATION.docx

Teradata Utilities

- Teradata Utilities & their commands are an important part of the exam.
- One should thoroughly review all the Teradata Utilities mentioned in Module 8 from the Orange Book "[Teradata Warehouse Administration 16.20](#)"
- It is recommended to practically use these utilities by setting up a Virtual Machine & running these utilities.
- We have summarized key commands & key utilities in the document attached below



Teradata
Utilities.docx

Teradata LOAD Utilities

- Teradata LOAD Utilities do not cover an extensive part of the exam. However it is still important to understand the basics of FASTLOAD, MultiLoad & TPT.
- TPT Operators should be reviewed & the candidate should understand the comparison of OPERATORS between fastload, Multiload & TPT.
- A summarized guide of LOAD Utility Comparison is attached below, which should help in understanding the key points.



Load Utilities.docx

TERADATA INTELLIGENT MEMORY – TIM

- Teradata Intelligent Memory (TIM) Phase-2 provides the ability to: Adjust the File Segment (FSG) TIM Very Hot (VH) cache size without a reset (tpareset)
- We reviewed the Orange Book “[Teradata Intelligent Memory 14.10](#)”, but if the latest version is available, that would be recommended.
- We have summarized key commands & key utilities in the document attached below



TIM.docx

TASM

- TASM covers an important & extensive part of the Adv DBA Exam. It is recommended that one reviews TASM & its features practically before appearing for the exam
- We reviewed the Orange Book “[Teradata Active System Management 16.20](#)”, & we highly recommend that a candidate reviews this book.
- The Candidate should understand the difference between TASM & TIWM. Difference between SLES 10 & SLES 11 should also be studied.
- Review all options of exceptions that are available on TASM.
- The exam will have scenario based questions for TASM. It is important to understand what type of queries run in TACTICAL, what runs in SLG & how to use the timeshare feature of TASM.
- Review how to control ETL Utilities through TASM Options that are provided.

Indexes

- Indexes such as PI, SI, Join Indexes and its types need to be reviewed.
- How to use SI on a Join Index needs to be reviewed. These details are available in the Orange Book “[Physical Database & Design V 16.20](#)”
- We’ve summarized some key points related to Teradata Indexes in the document attached.



TERADATA
INDEXES.docx

Global Space Accounting

- Global Space Accounting refers to the calculation of total available space at AMP level and global level by using provided skew percentage factors and global skew percentage factors.
- For more details on Global Space Accounting, please refer to the link below.
- A short example is also given below for reference

https://docs.teradata.com/access/sources/dita/topic?dita:mapPath=kae1480972952938.ditamap&dita:ditaavalPath=changebar_rev_16_10_exclude_audience_ie.ditaval&dita:topicPath=twf1493612468221.dita

Example:

Skew factor and soft limits can be cumulative. For example, consider the following numbers:

- Global limit: 800 MB
- Soft limit: 10 percent
- Per-AMP limit on a 4-AMP system: 200 MB
- Skew factor: 25 percent

With these numbers, the global limit can exceed the 800 MB limit by 10 percent (to 880 MB). In addition, an AMP can exceed the 200 MB limit by 25% (to 250 MB) if the total across all AMPs does not exceed 880 MB. Each of the AMPs can also receive an additional 20 MB because of the global soft limit. The cumulative effects of the skew factor and global soft limit can increase the maximum possible space allotment to an AMP to $250 + 20 = 270$ MB, as long as the total space used across all AMPs does not exceed 880. The user will receive an error message if either of the following limits are exceeded:

- The global limit of 880
- The per-AMP limit of 270

Teradata Maps

- Teradata Maps is an important part of the exam. The best way to review Teradata Maps is to review some tech-bytes/videos available from Carrie Ballinger, Sr Technologist (Teradata Technology & Innovation Office)
- We found these videos on Youtube, but We're sure they should be easily available elsewhere. The video References are given below.
- We've also added a small document, which covers key points of Teradata Maps.

| Title | Link |
|--|---|
| Teradata Vantage – MAPS: 1. Increasing the System Availability | https://www.youtube.com/watch?v=8PHGL9QLhF0 |
| Teradata Vantage – MAPS: Small Tables in Sparse Maps | https://www.youtube.com/watch?v=vKZq8AmPoGk |
| Teradata Vantage – MAPS: 3. Query Behavior | https://www.youtube.com/watch?v=T_7mAe1bJSY |



TERADATA
MAPS.docx

Teradata Columnar

- Teradata Columnar is a performance feature and physical design feature that offers the ability to partition a table by column, or to combine Column Partitioning (CP) and row partitioning on the same table.
- A key benefit of Columnar is the reduction of I/O and a smaller storage size, which can lead to faster query execution times. Four most common approaches to implement CP table:
- Pick a very big table with considerable number of columns but most queries access only a subset of columns
- Define the table with primary AMP indexing
- Use hybrid partitioning if a date-time column on that table is frequently used as a predicate, and for deleting by row partition
- Do very simple partitioning, each column in its own partition.

Good candidates for Columnar

- Table must be Multiset and should be greater than 1GB per AMP
- Table has greater than 50 columns
- Few or no rows are updated
- Few rows are deleted other than by means of row-partitioned tables
- Loading by means of large INSERT-SELECT operation is acceptable
- Number of predicate columns in the queries are relatively small, ideally one column in a query is highly selective
- Individual queries that access the table only require a small subset of the total columns, and the columns being accessed vary (Note: If the same columns are accessed frequently, then a sparse join index would be a reasonable alternative to columnar)