Teradata Bacis

Lesson 03 : Teradata Utilities (Bteq)

Module Object

- Introduction about Teradata
- Introduction to BTEQ.
- Use of BTEQ
- Transaction Mode in BTEQ
- Conditional Logic in BTEQ
- BTEQ Return Codes
- Using BTEQ to Export Data
- Using BTEQ to Import Data
- BTEQ Commands

Introduction about Teradata Utility

- What is the need of Teradata utilities in Data ware house
  - Quick access to data for more timely decision making.
  - Solutions for the entire spectrum of load requirements from batch to near real time.
  - Unmatched scalability for large volume loads.
  - Fail-proof loads with checkpoint restart capabilities.
  - Proven technology from the data warehouse technology leader.
  - Integration with industry-leading ETL and ELT tools.
- Teradata Utilities
  - BTEQ: Help for Report formatting, Ad hoc query tool, Database administration, Best for small data volumes.
  - Fast Export :High-performance data unload in client format.
  - Fast Load: High-performance initial table load.
  - Multi Load: High-performance maintenance operations applies updates to multiple tables in single pass.
  - Apart from these teradata having other utilities like Teradata Parallel
  - Transporter,Tpump e.t.c.

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Introduction to BTEQ

- The core and main utility of Teradata is BTEQ , which stands for Batch/Basic Teradata
- Query. This is a command –based utility submitting SQL requests to the Teradata database.
- Characteristics:
  - BTEQ (Basic Teradata Query) operates in either a Batch or Interactive mode.
  - BTEQ runs on every supported platform.
  - BTEQ has the ability for Exporting data from database and importing data to database.
  - BTEQ has flexible and easy-to-use report writer.
  - Reads input data and imports it to the Teradata database as INSERTs, UPDATEs or DELETEs.
  - Exports data to a client system from the Teradata database:

    As displayable characters suitable for reports, or

    In native host format, suitable for other applications.
- BTEQ does error reporting.

Supporting Environment

- The Fast Export utility is supported either on either the mainframe Or on network attached system(LAN.

The LAN environment supports the following Operating Systems:

- UNIX MP-RAS
- Windows 2000
- Windows 95
- Windows NT
- UNIX HP-UX
- AIX
- Solaris SPARC
- Solaris Intel

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Supporting Environment

- The Mainframe (Channel Attached) environment supports the following Operating Systems:
  - MVS
  - VM

CAUTION: The Teradata RDBMS will only support a maximum of 15 simultaneous
FastLoad, MultiLoad, or FastExport utility jobs

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Use of Bteq

- Bteq can be used either batch or interactive environment.
  - Interactive Mode:
- Interactive users can submit SQL and receive an answer set on the screen.
- Steps to follow:
  - Use the word bteq.
  - Logon by giving the host id/user id.
  - Give the correct password for this user.
  - After connect the session use the required query to get the result.

Use of Bteq

- Batch Mode:
  - Users can submit BTEQ jobs from batch scripts, have error checking and conditional logic, and allow
  - for the work to be done in the background.
- To submit a job in Batch mode do the following:
  - Invoke BTEQ
  - Type in the input file name
  - Type in the location and output file name.

Use of Bteq

Example: BatchScript.txt

```
.LOGON 10.67.180.194/u_dev2,XXXX        --------Log on information with  password

Select * from emp where                 ------Select Query
dept_no=10;

.LOGOFF                                 ------Log off
```

Run the Script through the command

```
C:/>bteq <BatchScript.txt>output.txt
```

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Transaction Mode

- Teradata works in two modes:
  - Teradata Mode
  - ANSI Mode

- While using BTEQ, it is possible to over-ride the transaction mode at the session level. Since the session is established at logon time, it is necessary to set the mode prior to issuing a logon connection request. In BTEQ, either of the following commands can be used to change to ANSI or Teradata (BT-ET) mode:

  - SET SESSION TRANSACTION BTET;

  Or

  - .SET SESSION TRANSACTION ANSI;

Transaction Mode

- BT-ET Mode: Use a BT-ET statement to Begin Transaction (BT) and End Transaction (ET). Like
- BT;

// SQL statements;

//SQL statements;

- ET;
  - When multiple statements are placed into a single transaction in Teradata Mode (BT-ET
  - mode) an error with any statement causes all of the SQL statements to ROLLBACK and then all locks are released and it is committed automatically if the entire transaction is successful. This means all the SQL statement placed in the BT-ET block are treated as a single statement.
  - It is also called the explicit transaction mode. When multiple statements are included in BT-ET mode, you can only specify a DDL statement if it is the last statement.

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Transaction Mode

- Multi-Statement Request:
  - Another way to achieve the Teradata mode is Multi-Statement Request. Multi-statement request is created in BTEQ by placing ending semi-colons as the first character of next SQL statement and makes the statement list as one transaction. Here is an example of a BTEQ transaction in Teradata Mode that is considered one transaction:

```
UPDATE Employee_Table
SET Salary = Salary * 1.1
SET Dept_Name = 'Sales'
WHERE Dept_No = 10;
```

- In multi-statement request, if a transaction has any SQL fail then all SQL statements are rolled back and locks are released. DDL statements are not valid in an implicit multi-statement transaction.

Transaction Mode

- ANSI Mode:
  - In ANSI mode, just the opposite is true. All SQL commands are considered to be part of the same logical transaction. A transaction is not complete until an explicit COMMIT is executed. Therefore, each of the DML commands in ANSI mode needs to perform the following command to permanently store the data, and more importantly, release the write locks that are currently held.
- COMMIT WORK:
  - As an example, to remove all rows both statements below can be needed in ANSI mode.

```
DELETE FROM TEST_TABLE;
COMMIT WORK;
```

  - Without a COMMIT WORK, it is likely that the DELETE will abort and all the rows will be put back.

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Conditional Logic in BTEQ

- Create a duplicate table same as ernp table:
- 1-LABLE Tbl_fail
- Delete the records from the duplicate table dup_emp, if it has,
- If the result is non zero then create the duplicate table, else attempt to insert the records from parent table emp.
- If getting non zero result in insert activity then go to the next instruction,

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BTEQ Return Codes

- Bteq Returns two-digit values to the user after completing each job or task

The value of the return code indicates the completion status of the job or task as follows.

- Return Code Description;
  - 00 Job completed with no errors.
  - 02 User alert to log on to the Teradata DBS.
  - 04 Warning error.
  - 08 User error.
  - 12 Severe internal error.
- You can over-ride the standard error codes at the time you terminate BTEQ. This might be handy for debug purposes. The error code or "return code" can be any number you specify using one of the following
- Override Code Description;
  - .QUIT 15
  - .EXIT 15

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Using BTEQ to Export Data

- IBTEQ alHows. data tu be exported directlv from Teradata tu a fHe on a mainframe or network-attached computer,with desired output.
- Generallv , user exported data in with different export format, composed of vari1ety of characteristics,

F'onm1at of Export command :

.. EXPORT <mode> {FIILE [I DDNAME} =<filename>[, UMIT=n

Exa1mplIle :

Bteq script: exportl.btq

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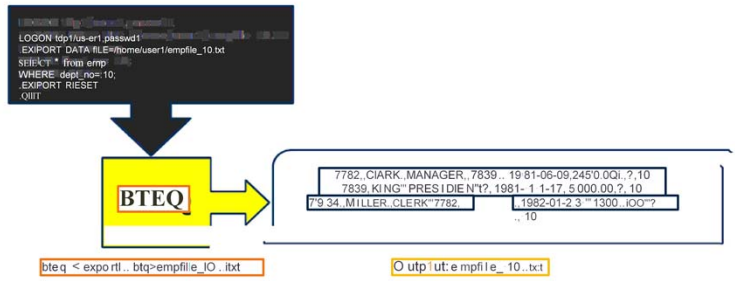
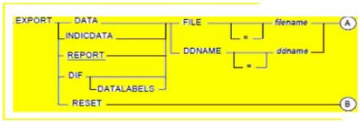
Using BTEQ to Export Data



Using BTEQ to Export Data



- Record Mode (also called DATA mode): This is set by. EXPORT DATA. This w111II bring data back. as a flat file. There are no headers or white space between the data contained in each column and the data Is written to the file in native format, not understood using text editor.

- Field Mode (ialso called REPORT mode): This is set lby .EXPORT REPORT This is the default mode for BTEQ and brings the data back as if it was a standard SQL SELECT statement, output of this BTEQ export would return the column headers for the fields, and better understood m text editor.

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Using BTEQ to Export Data

- Indicator Mode:
  - This is set by .EXPORT INDICDATA. This mode writes the data in data mode, but also provides host operating systems with the means of recognizing missing or unknown data (NULL) fields. This is important if the data is to be loaded into another Relational Database System (RDBMS).
- DIF Mode:
  - Known as Data Interchange Format, which allows users to export data from Teradata to be directly utilized for spreadsheet applications like Excel, FoxPro and Lotus.
  - In Mainframe export the data into the file by define command
  - .EXPORT DATA DDNAME = data definition state name (JCL)
  - In LAN export the data into the file by define command like :
  - .EXPORT DATA FILE = actual file name

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Using BTEQ to Import Data

- BTEQ can also read a file from the hard disk and incorporate the data into SQl to modify the contents of one 01r moire tables. In order to do this processing, the name and record description of the file must be known ahead of time. These wrn be defined within the script file.

- f'onmat of the MPORT command:

.IMPORT {FILE DNA.ME}=< fHename>[. SIKIP=n]

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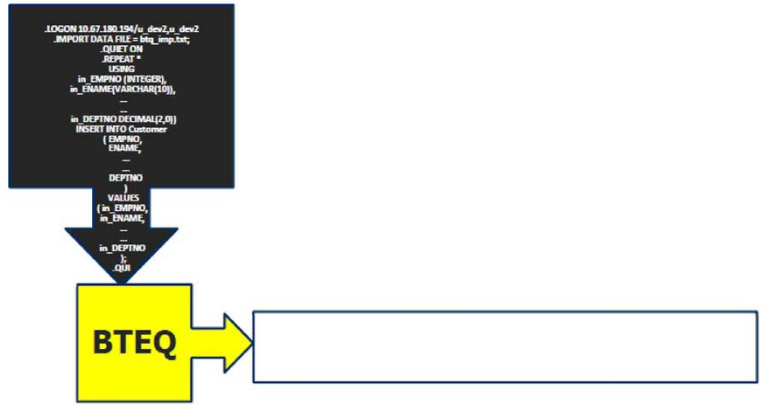
Using BTEQ to Import Data



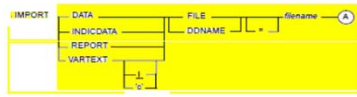
Using BTEQ to Import Data

- BTEQ can also read a file from the hard disk and incorporate the data mto SQ .to modify the contents of one

Using BTEQ to Import Data

- BTEQ can also read a file from the hard disk and incorporate the data into SQL to modify the contents of one or more tables, In order to do this processing, the name and record description of the file must be known ahead of tune, These will be defined within the script file.

For Network-Attached Systems:



format of the MP'ORT command:
.IMPORT { FILE | D A ME}= <filename>(,S|KIP=n]

For Channel-Attached .Sys terns:

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Using BTEQ to Import Data

- Data :- Imports data from the server to Teradata with a USING clause.
- INDICDATA :- Import records contain NULL bits.
- REPORT :- Imports Teradata “report”data. Data expected in BTEQ EXPORTREPORT format.
- VARTEXT :- Record format as variable length character fields. Default delimiter is | or specify with field delimiter within single quotes.

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BTEQ Commands

The BTEQ commands i1n Teradata are designed for flexiblllty These commands are not used direcUy on the data inside the tables. However, these 60 ditferent HTĖQ commands are utilized in four areas.

)io'"Session Control Commands:
begin and end BTEQ sessions, and control session characteristics.

- File Control Commands:
  Spedfy input and output formats and identify information sources and destinations,

)io'"Sequence Control Commands:
control the sequence in which other BTEQ commands and Teradata SQL statements willl lbe executed within scripts and ma cros.

- Format Control Commands:
  control the format of screen a nd printer output.

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BTEQ Commands

Session Centro **Command**

ABORT	Abort any and all active running requests and transactions, but do not exit BTEQ.
DEFAULTS	Reset all BTEQ Format command options to their defaults. This will utilize the default configurations.
EXIT	Immediately end the current session or sessions and exit BTEQ.
HALT EXECUTION	Abort any and all active running requests and transactions and EXIT BTEQ.
LOGOFF	End the current session or sessions, but do not exit BTEQ.
LOGON	Starts a BTEQ Session. Every user, application, or utility must LOGON to Teradata to establish a session.
QUIT	End the current session or sessions and exit BTEQ.
SECURITY	Specifies the security level of messages between a network-attached system and the Teradata Database.
SESSIONS	Specifies the number of sessions to use with the next LOGON command.
SESSION CHARSET	Specifies the name of a character set for the current session or sessions.
SESSION SQLFLAG	Specifies a disposition of warnings issued in response to violations of ANSI syntax. The SQL will still run, but a warning message will be provided. The four settings are FULL, INTERMEDIATE, ENTRY, and NONE.
SESSION TRANSACTION	Specifies whether transaction boundaries are determined by Teradata SQL or ANSI SQL semantics.
SHOW CONTROLS	Displays all of the BTEQ control command options currently configured.
SHOW VERSIONS	Displays the BTEQ software release versions.
TDP	Used to specify the correct Teradata server for logons for a particular session.

BTEQ Commands

Sequence Control Commands

CMS	Execute a VM CMS command inside the BTEQ environment.
ERROROUT	Write error messages to a specific output file.
EXPORT	Open a file with a specific format to transfer information directly from the Teradata database.
HALT EXECUTION	Abort any and all active running requests and transactions and EXIT BTEQ.
FORMAT	Enable/inhibit the page-oriented format command options.
IMPORT	Open a file with a specific format to import information into Teradata.
INDICDATA	One of multiple data mode options for data selected from Teradata. The modes are INDICDATA, FIELD, or RECORD MODE.
OS	Execute an MS-DOS, PC-DOS, or UNIX command from inside BTEQ.
QUIET	Limit BTEQ output displays to all error messages and request processing statistics.
REPEAT	Submit the next request a certain amount of times
RUN	Execute Teradata SQL requests and BTEQ commands directly from a specified run file.
TSO	Execute an MVS TSO command from inside the BTEQ environment.

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BTEQ Commands

File Control Commands

ABORT	Abort any active transactions and requests.
ERRORLEVEL	Assign severity levels to particular error numbers.
EXIT	End the current session or sessions and exit BTEQ.
GOTO	Skip all intervening commands and resume after branching forward to the specified label.
HANG	Pause BTEQ processing for a specific amount of time.
IF...THEN	Test a stated condition, and then resume processing based on the test results.
LABEL	The GOTO command will always GO directly TO a particular line of code based on a label.
MAXERROR	Specifies a maximum allowable error severity level.
QUIT	End the current session or sessions and exit BTEQ.
REMARK	Place a comment on the standard output stream.
REPEAT	Submit the next request a certain amount of times.

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BTEQ Commands

Format Control Commands

RETRY	Retry requests that fail under specific error conditions.
RTITLE	Specify a header appearing at the top of all pages of a report.
SEPARATOR	Specifies a character string or specific width of blank characters separating columns of a report.
SHOWCONTROLS	Displays all of the BTEQ control command options currently configured.
SIDETITLES	Place titles to the left or side of the report instead of on top.
SKIPLINE	Inserts blank lines in a report when the value of a column changes specified values.
SUPPRESS	Replace each and every consecutively repeated value with completely-blank character strings.
TITLEDASHES	Display dash characters before each report line summarized by a WITH clause.
UNDERLINE	Display a row of dash characters when the specified column changes values.
WIDTH	Specifies the width of screen displays and printed reports, based on characters per line.

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QUIZ

- Which application interface is used by BTEQ?
  - A. ODBC
  - B. JDBC
  - C. CLIv2
  - D. OLE DB

- Which two functionalities are available through the BTEQ tool? (Choose two.)
  - A. supports ad hoc queries
  - B. is checkpointrestartable
  - C. runs scripted batch queries
  - D. provides high volume data export

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BTEQ: LAB Exercise

- Problem BTEQ_1 :
- In this lab, you will use BTEQ to perform imports with different numbers of sessions. You will move selected rows from a data file to the OLAP_EXAMPLE_CLASS table using different sessions.

- What you need
- OLAP_EXAMPLE_CLASS table and a data file.

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BTEQ: LAB Exercise

- Tasks
- 1. Export all the rows to a data file (data2_1) from OLAP_EXAMPLE_CLASS table.
- 2. Delete all rows from your OLAP_EXAMPLE_CLASS table.
- 3. Import the rows from your data set (data2_1) to the empty OLAP_EXAMPLE_CLASS table. Note the time and verify the number of rows.

- Time: Number of rows:
- 4. Delete all the rows from your "userid.OLAP_EXAMPLE_CLASS_DMY" table again. (Continue with
- the next slide…)

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BTEQ: LAB Exercise

- 5. Specify 8 sessions and import the rows from your data set to the OLAP_EXAMPLE_CLASS table. Note the time and verify the number of rows.
- Time: Number of rows:
- 6. Delete all the rows from OLAP_EXAMPLE_CLASS table again.
- 7. Specify 50 sessions and import the rows from your data set to OLAP_EXAMPLE_CLASS table. Note the timing and verify the number of rows.
- 8. What are your conclusions based on the tasks you have just performed?

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