

Crystal Reports

How to report off a Teradata Database

Overview

What is Teradata? NCR Teradata is a database and data warehouse software developer. This whitepaper will give you some basic information on the structure of Teradata databases, and assist you in reporting off a Teradata data source.

Contents

INTRODUCTION	2
TERADATA PARALLEL ARCHITECTURE	2
<i>Overview</i>	2
<i>Teradata Tools and Utilities</i>	3
OVERVIEW OF A DATA WAREHOUSE	4
Star Schema:	4
Snowflake Schema:	4
CONNECTIVITY	5
ODBC Driver for Teradata	5
STEPS TO CONNECT USING CRYSTAL REPORTS VIA ODBC	5
TROUBLESHOOTING	5
FINDING MORE INFORMATION	6

Introduction

Teradata Database V2R5.0 is the latest release of Teradata's Relational Database Management System (RDBMS). Teradata includes active data warehousing and analytical processing. Teradata Database V2R5.0 is available on both the UNIX and Microsoft Windows 2000 operating systems.

The Teradata Warehouse solution is comprised of both hardware and software components that leverage parallel processing technologies. The current release of the Teradata database supports both Symmetric Multi-Processing (SMP) and Massively Parallel Processing (MPP) architectures on both Microsoft Windows and UNIX operating systems and hardware platforms.

The Teradata database does not rely on SMP and MPP parallel processing systems for parallel processing support; instead, the database itself invokes parallel processing methodologies independent of the hardware platform.

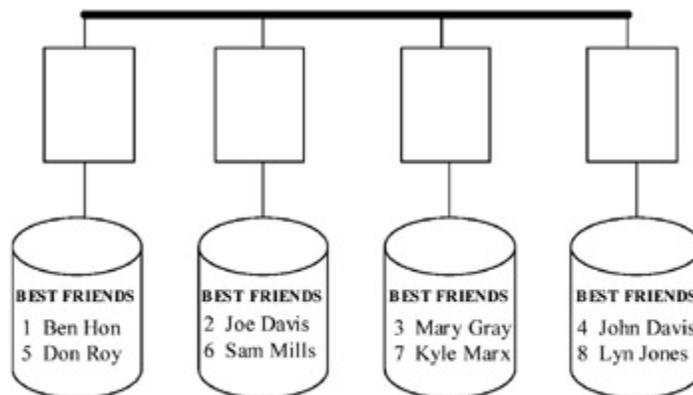
Teradata Parallel Architecture

Overview

A key aspect of Teradata's parallel processing technology is "Linear Scalability," which allows unlimited growth with minimal effects on response time. Each time a new processor is added in Teradata, a new storage disk is also added, so the system can continually grow without worries about the disk becoming the data bottleneck.

The system below has four processors, and each is assigned two rows of data. When we ask for our "Best Friends," the system will read all eight rows. Since data is spread evenly over four processors, Teradata reads two rows simultaneously across four processors. Now the system is four times faster.

Tables in most data warehouses hold millions, even billions of rows. Teradata allows you to decide how many processors are needed to get the desired response time; some customers have thousands of processors. Tasks are divided up between the Access Module Processors, or AMPs, and processed in parallel.



Teradata Tools and Utilities

Teradata includes several administrative tools and user utilities to allow you to effectively manage and interact with the Teradata database environment. Teradata comes with both an Analyst Pack and a Utility Pack.

The **Analyst Pack** provides a set of tools that allow you to develop and optimize complex queries, as follows:

- **Visual Explain** – a visual aid for depicting query execution.
- **System Emulation Tool (SET)** – this allows a larger production environment to be emulated on a smaller test or development configuration.
- **Index Wizard** – an Index management and optimization tool.
- **Statistics Wizard** – a statistical analysis recommendation and optimization tool.

The **Utility Pack** provides components to allow you to connect to and manage your Teradata database environment, and includes the following components:

- **ODBC Driver for Teradata** – this provides a standard way for client platforms to connect to the Teradata database. This is the only tested platform for connectivity with Crystal Reports.
- **OLE DB Provider for Teradata** – a COM-based API that provides a standard interface for Windows based applications to interact with the Teradata database. This has not been tested with Crystal Reports.
- **JDBC Interface for Teradata** – a standard interface to allow Java applets or applications to interact with the Teradata database. Both 2-tier and 3-tiered implementations of the JDBC driver are supported. This has not been tested with Crystal Reports.
- **Teradata Call Level Interface (CLI)** – this enables client and server applications to use the same interface to programmatically run SQL statements against the Teradata database. This has not been tested with Crystal Reports.
- **SQL Assistant/Queryman** – an essential and easy to use Windows-based SQL query tool that can be used against Teradata or any other ODBC compliant database. It works in a similar manner to SQL Server's Query Analyzer. Teradata. Queryman was renamed to SQL Assistant in v2R5.
- **SQL Assistant/Web Edition** – this is the same as the SQL Assistant, but is a web-based tool. This tool also provides a Query History database that stores prior queries executed for future reference.
- **BTEQ Language** – a command-based tool used to perform either batch or interactive query and database management operations against the Teradata database.
- **Teradata Administrator** – a Windows-based data dictionary management tool for administration of the Teradata database.
- **Teradata MultiTool** – a GUI tool for Teradata database administration, designed for quick execution of a variety of administration tasks.

Overview of a Data Warehouse

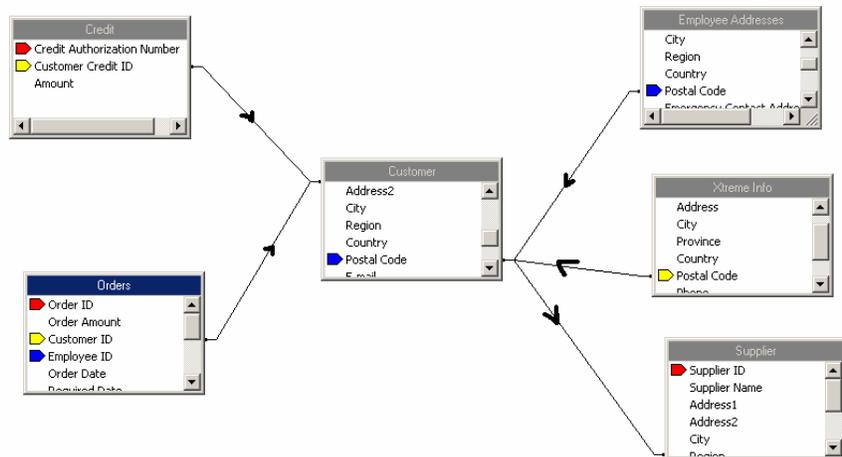
What is a Data Warehouse? A Data Warehouse allows users to retrieve data more efficiently than accessing a database directly. A single data warehouse can be built around a set of incompatible products like DB2, Sybase and Teradata databases and can bring all the data together, making it easier to work with.

Data warehouses will often have a set of indexes for specific search criteria for a database, like a sort order. It is often thought of as a Meta layer.

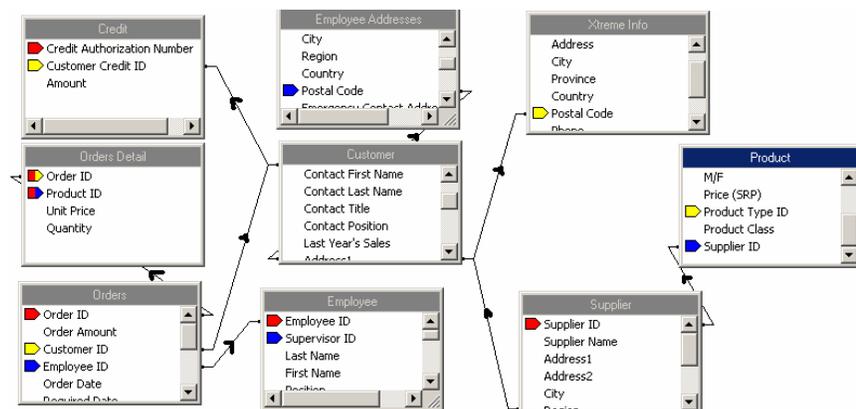
Data Warehousing uses schema structuring like Star or Snowflaking.

The Star schema is a standard schema formation which has fewer joins, more efficient queries and various dimensions: slowly changing, hierarchical, hybrid, and rapidly changing monster dimensions. The Snowflake schema is more normalized, where a single flat dimension is decomposed into a tree-like structure with many nesting levels. Because the Snowflake schema is more normalized, it is easier to maintain and provides significantly better browsing performance; and it can achieve space savings gains.

Star Schema:



Snowflake Schema:



Connectivity

ODBC Driver for Teradata

Crystal Reports can use Teradata's ODBC Driver, Tdata32.dll (v.3.02.00.02) to report off its database. This driver is included with the Utility Pack.

The following prerequisites are required to connect to Teradata via ODBC:

- Supported Operating systems – Please check the supported platforms text file included with our product CD or from the Knowledge base for the latest updates of the current version of Crystal Reports.
- The Teradata client must first be installed.
- You must have at least “read” rights to the database objects you wish to report off.
- You must be using Crystal Reports 9 and 10 Professional editions or above.

Steps to connect using Crystal Reports via ODBC.

1. In Crystal Reports 10, on the **File** menu, click **New**.
2. Select the **As a Blank Report** option button and then click **OK**.
3. In the **Database Expert** dialog box, double-click **Create New Connection**, and then double-click **Database Files**. Browse to your ODBC DSN and select the Teradata datasource you created.
4. Choose the Teradata database that you have rights or permission to read.
5. Open the tables, views, or stored procedures folder then select the object you want to report off.

NOTE	ODBC is the only tested way to connect to Teradata with Crystal Reports. There is currently no native driver available.
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Troubleshooting

For information on limitations using the ODBC Driver Tdata32.dll v. 3.02.00.02 3/20/03 (for Teradata v2r5), please refer to the following knowledge base articles (search for these article numbers at [http://support.businessobjects.com/search:](http://support.businessobjects.com/search;))

c2014023 — Maximizing performance when connecting to Teradata

c2013847 — Err Msg: “Invalid cursor state” when connecting to Teradata

Finding More Information

For more information on designing reports , see the Crystal Reports Users Guide.

For more information on Teradata, see the Teradata v2r5 manuals or online help.

For more information and resources, refer to the product documentation and visit the support area of the web site at: www.businessobjects.com.

DISCLAIMER	<p>The third party products discussed in this white paper were not fully tested in conjunction with Crystal Enterprise prior to its release. Officially supported Crystal Enterprise platforms are listed in the text file Platforms.txt found in the root folder of the Crystal Enterprise CD as well as in the Knowledge Base article c2009003 (search for this article number at http://support.businessobjects.com/search), which is more current.</p> <p>The information in this document is provided as a courtesy to assist our customers with the configuration of our product in conjunction with these third party platforms.</p> <p>In the event issues arise with an unsupported configuration, there is no escalation support; however, they will be considered during the development of the next generation of our product.</p>
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