Introducing the Teracruz dbAppliance

The Teracruz **dbAppliance™** provides a simple, cost-efficient way to improve application and database performance. Installed on the network with application and database servers, the dbAppliance accelerates application response, offloads database servers, provides zero-overhead performance management, and improves database availability.

The dbAppliance offers the following features:

- **Database Acceleration** - SQL Query Result Caching technology improves application response time 500% to 1000% and offloads database servers.
- **Zero-Overhead Performance Management** - Requiring no software installation on servers, the dbAppliance monitors, logs, analyzes, and archives database performance and usage data.
- **Service-Level Management** - The dbAppliance Service Manager allows real-time, continuous monitoring of customized application and database service levels and can alert administrators when service-levels thresholds are exceeded.
- **High-Availability and Load Balancing** – The dbAppliance provides failover and load-balancing options for servers, improving server availability. In addition, dbAppliance units may be clustered to provide redundant operation.
- **Integrated User Interface** – All dbAppliance features are accessed and controlled through Teraview, a single, integrated graphical user interface.

This manual describes the installation and operation of the dbAppliance, and provides a reference for the Teracruz user interface.

Features and Benefits

SQL Query Result Caching

The dbAppliance is the first product to offer network-based ***SQL query result caching*** for improving application response and offloading database servers. This patent-pending technology provides a quick and straightforward means of acceleration that can yield dramatic results.

Residing on the network with application servers and database servers, the dbAppliance inspects all traffic to and from the database. The dbAppliance caches queries to the database and corresponding result-set responses, and fulfills subsequent identical queries from the cache instead of forwarding the query to the database server. Data integrity is maintained by inspecting all incoming SQL for write operations and invalidating any cache entries that contain a reference to the modified tables (or views that depend on the modified tables). Caching is fully configurable and can be controlled down to the table level.

The dbAppliance uses a highly optimized, purpose-built network caching engine. Queries that are fulfilled from the dbAppliance cache are processed much faster than with even the fastest database, resulting in significant improvements in application response. In addition, cache-fulfilled queries reduce the load on database servers, providing them with more processing capacity for servicing other requests.

Zero-Overhead Performance Management

The dbAppliance offers extensive database and application performance management capabilities. Contrasted with other monitoring products, the dbAppliance imposes no server overhead and requires no software installation on application or database servers. It features a browser-accessible user interface and provides extensive insight into the performance and usage of databases and applications.

dbAppliance reports are invaluable for both administrators and developers seeking to understand, troubleshoot, monitor, and improve the performance of application infrastructure. All database access is logged and analyzed according to response time, query type, data volume, table and column accesses, etc. Analysis is presented in a variety of graphical and tabular formats, as well as Teracruz's exclusive map displays. All components within the application infrastructure (databases, servers, clients, and users) are automatically discovered and displayed in an expandable tree format, and all reports may be filtered by server, client, database, or user.

Service Level Management

The optional Service Manager software enables performance data to be exported to any relational database for baseline recording and offline trend analysis. It also provides extensive real-time performance alerting capability, notifying administrators when defined performance service levels have been exceeded.

High Availability

The dbAppliance supports clustering of multiple units to provide redundant operation in applications requiring high availability. In addition, upcoming releases of the dbAppliance will support simultaneous load-balancing and connect-time failover operation, providing a simple and inexpensive means of substantially improving database availability.

dbAppliance Database Compatibility

The dbAppliance works by inspecting network traffic to and from databases. The network protocols used for database access are typically non-standard and vary by database version, operating system, and hardware platform. Database compatibility for the dbAppliance is specified in Table 1.

Database	Operating System
Oracle 7.2.3 and higher, JDBC thin driver	All operating systems
Data Direct Oracle Wire Protocol ODBC driver	All operating systems
IBM DB2 Versions 8 (uses DRDA version 3)	All operating systems

Table 1 -- dbAppliance Database Compatibility

Standard Report Reference

Acceleration Summary

The Acceleration Summary portal on the System Status report gives a summary report for the Return on Investment (ROI) that the dbAppliance has provided.

Query Acceleration	This is the percentage acceleration that the dbAppliance has provided since ROI monitoring was last reset.
Start Time	The time that ROI monitoring was last reset.
Total Select Time	The total amount of time spent by clients issuing queries.
Select Time Saved	The amount of time saved by the dbAppliance caching mechanism. This is the server's time to service a query, multiplied by the number of cache hits for that query.

Active Sessions

The Active Sessions report provides detailed information about the active sessions of your DBMS captured by the dbAppliance. This report includes the client, database, user, and server names associated with the active session. This report also lists the duration of the session and total number of table accesses, and indicates the cache status per session. The cache status indicates whether the system elements and settings are conducive to query result caching for the session. If caching is enabled globally (Tools > Options > Acceleration > Cache Mode), and enabled for the session server, database, client, and user, then the status shown will be **Enabled**. If the global setting or any one of the session elements are not cache enabled, then the status will be shown as **Disabled**. Further, please note that caching also must be enabled at the table level to enable query result caching, but the Active Session Cache Status does not reflect cache enable settings at the table level due to the dynamic nature of table cache settings.

Cache Statistics

The Cache Statistics report shows the percentage of cached accesses and the number of cached entries and cached flushes (invalidations) over the period of time shown at the bottom of the graph. The time period can be changed in the Cache Statistics Configure menu by pointing to the **Cache Statistics** Tab and right clicking, then pointing to **Configuration**.

Client Information

The Client Information report provides detailed information about the client computer including name, IP address, operating system, and time when the client was discovered and last accessed.

Column Accesses

The Column Accesses report shows the number of accesses made to a table column over a time period configured on the Time Series Configuration dialog. Column accesses are summed for the Navigator icons below the cursor. For example, selecting a database entry in the Navigator sums all column accesses for tables within that database.

Last Queries

The Last Queries report displays the last fifty queries against the server, database, user, or client as selected on the navigation tree. This report also provides the tree element name, the last query text, and the start time, overall duration and client wait time of the last queries received. The Cache Hit column indicates where the statement response came from: Cache Hit equals *true*, if it came from the dbAppliance query result cache, or Cache Hit equals *false*, if it came from the database server.

Network Traffic

The Network Traffic report displays the amount of traffic to/from the client and to/from the server for the time period set on the Time Series Configuration dialog. The Network Traffic graph is a very powerful tool when accessing dbAppliance cache effectiveness and server offload.

Pending Queries

The Pending Queries report displays the queries pending on the server, database, user, or client as selected on the navigation tree. This report also provides the query text, and the pending start time and duration of the pending query. The Cache Hit column indicates where the statement response is coming from: **Cache Hit** equals *true*, if it is coming from the dbAppliance query result cache, or **Cache Hit** equals *false*, if it is coming from the database server.

Query Response Map

The Query Response Map report uses the size of rectangles to represent the volume of selects issued to a server or database on a per user basis. The color of the rectangle indicates the select response time. After setting the time in the Duration field, move the slider to show selects issued per user over the total time duration of the report.

Query Response Time

The Query Response Time report displays the query response time for the server selected in the navigation tree against the time configured in the Time Series Configuration dialog. Response time for query type is indicated by the color legend for selects, inserts, updates, and deletes. Response time for other types of statements is represented by *Other Response Time*.

Query Traffic

The Query Traffic report displays select count active sessions and select responses on the DBMS for the period of time set on the Time Series Configuration dialog. This report shows the number of queries received by the server and the number of sessions active against server during the configured response time.

Query Types

The Query Types Over Time report shows the percentage of query types made against a server, database, table, user, or client over a time period configured on the Time Series Configuration dialog.

Server Information

The Server Information report provides detailed information about the server computer including name, IP address, operating system, and the time when the server was discovered and last accessed.

Slow Queries

The Top Queries Map is a tree-map rendering of the Top Queries tabular report. The size of the rectangle represents the count of the top query. The color indicates the query response time. Clearing the Top Queries Report also clears the Top Queries Map.

Slow Query Map

The Slow Query Map is a tree-map representation of the Slowest Queries tabular report. The report uses rectangle size to show the number of counts of the slow query relative to other slowest queries. The color of the rectangle indicates the average response time. Clearing the Slowest Query tabular report resets the Slow Query Map.

System Overview

The System Overview report is a default dashboard, or a collection of reports. You can configure each report to define a unique snapshot of your DBMS system. Use the sliders at the bottom and side of the report to display the reports. Select options from the **Actions** drop-down list to configure the report, move or copy the report tab to the Tabs display, or close the report. For more information on these options, refer to the Tabs Menu Options section in this chapter.

System Status

The System Status report describes the D100 dbAppliance system. The Actions drop-down menu provides options for modifying system parameters, moving or copying the System Status report to a tab, or closing the report. The System Options dialog is described in the next section.

System Name	Name of the dbAppliance unit
User Name	Name that identifies a user to the system.
Up Time	Amount and date of time the system has been active.
Cache Status	Refers to cache mode, either Enabled or Disabled.
Cache Entries	Number of cache entries processed by the system.
Active Sessions	Number of active sessions.
D100 RAM	Amount of RAM provided by dbAppliance

Table Accesses

The Table Accesses Statistics report displays the number of table accesses and joins for the table as displayed on the report and selected on the navigation tree against the time configured in the Time Series Configuration dialog.

Table Access Map

The Table Accesses and Joins report uses rectangle size to show the relationship of the table accesses and joins on the server or database listed on the report as compared to all the tables in the report. Table hits are indicated by the size of the rectangle relative to other tables hit on the server or database. The color indicates number of joins for the particular table.

After setting the time in the Duration field, move the slider to show accesses and joins over the total time duration of the report. Configure the time period for the report on the Response Map Configuration dialog.

Top Queries

The Top Queries report indicates the queries most frequently received by the server, database, user, or client as displayed on the report and selected in the navigation tree. This report also provides the number of times each query was received, the minimum and maximum amount response time, the average amount of response time for each query, and the last time the query was received for the time period that the dbAppliance was powered on or since the Top Queries report reset was issued by the Clear Top Queries selection in the report Configuration dialog. The Cache % column indicates the percentage of time the statement response was retrieved from the dbAppliance query result cache.

Top Queries Map

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