Q Diagnostic Center™ 1.1 Users Guide

Creative Credits

ORACLE Expert	John Beresniewicz	
Visual Design	Laura Lucas	
Development Team	Andy Bruce, Brett Shriver, Alexandra Suh	
QA Analyst	Craig Cook	
Documentation	Arlene Haskins	
DBA Advisory Group	Sam Youngman	DBA / Independent
	Randy Hughbanks	DBA / Citibank
	Rick Cotton	DBA / Independent
	Steve Mowl	DBA / Independent

This manual prepared by:

Savant Corporation
6430 Rockledge Drive
Bethesda, MD 20817

Customer Service Hours: Monday - Friday 8:30AM to 5:30PM EST
Telephone: 800.956.9541
301.581.0500

Q SUPPORT Technical support for Q is available by Electronic Mail, FAX and Phone Hotline

Electronic Mail

Our email support is available 24 hours a day. It is the preferred method to request technical support outside of North America. A Software Problem Report form is provided in the root directory of the CD (Qsupport.txt) and is copied to the Savant directory. Please fill out this form and mail it to:

Qsupport@savant-corp.com

A technical support engineer will return your email within one Savant business day.

Facsimile

Our FAX support is available 24 hours a day. A Software Problem Report form is provided in the root directory of the CD (Qsupport.txt) and is copied to the Savant directory. Please fill out this form and FAX it to the number listed below. A technical support engineer will respond within one Savant business day.

Hotline

Our telephone support Hotline is open from 8:30 AM to 5:30 PM US Eastern Standard Time. Calling the Hotline connects you to the developers who wrote the Q product. If no engineer is available when you call or if you call during non- business hours, you will be prompted to leave your phone number and a message describing your problem. A technical support engineer will respond within one Savant business day.

Hotline:	1.301.581.0504
FAX Support	1.301.581.0590

Updates

As they become available, Q updates can be obtained from the Savant WWW Home Page located at http://www.savant-corp.com in the Software Updates area. The Updates are provided in the form of self-extracting, self-installing executable files.

Table of Contents

President's Note

Savant is run by a group of DBAs who set out to develop products, which would ACTUALLY help Database Administrators, do their job. As we enter our fourth year, we are adhering to the founding concepts. First, products had to actually SOLVE problems and give time back to the DBA. Second, we agreed to never lose focus of the day to day problems that our colleagues faced.

The response for Q and requests to expand Q into other environments has been overwhelming. We have listened and will release version 2.0 in the second quarter of 1998. Q V2 will be a major leap for the product. Q's interface shocked the industry in version 1.0. Version 2.0 will bring new meaning to diagnostics and system management. As we progress, we need your continued input, if we are to hold to our original goals.

We are sincerely dedicated to building a product which challenges System Management vendors to develop diagnostic tools which help you do your job and which save you time. I challenge you to help us in this effort. Please give us a call and share your thoughts, needs or gripes. If you find Q useful, please spread the word.

Thank you for your continued support.

William Wynn
President, Savant Corporation

New Features

Q VIEWER

Replay Mode	Replay Instance Overview for any point in time Instantly evaluate performance for the past 24 hours See performance peaks, valleys and trends in 30 day periods See when the database has been down See long term performance trends
Multiple Instance	Open and View multiple instances from a single Q Viewer session
SQL Window	Explain SQL statements as another user Explain provides weights and detailed statistics for each line of the plan, including Parallel Query support Format complex SQL and PL/SQL blocks
Q pop-up Lists	Open and analyze multiple lists simultaneously Columns size automatically to maximize viewing capabilities Save list contents to file Print list contents, including selective printing Sorts optimized for large lists
Help	Online Help provided, including context sensitive Help

DIAGNOSTIC ENGINES

for Oracle	Configure collection intervals to meet your specific needs Collection algorithms optimized
for Client	Broadcast and inspect Windows 3.x clients View and diagnose clients across multiple network segments

1 Getting Started

HOW Q WORKS The Q system is comprised of three distinct parts: The Q Viewer and Diagnostic Engines for ORACLE and the Client.

VIEWER The Viewer resides on any Windows 95 or NT platform and provides the administrator with a window into the collection system. When activated, operational statistics are retrieved from the Diagnostic Engines. The Viewer can be used to provide continuous visual monitoring of your system, or it can be activated when there is a problem to "See what is going on". In either case, all current and historical information is available, because the actual collection takes place within the Diagnostic Engines, not the Viewer itself.

DIAGNOSTIC ENGINES The Diagnostic Engines are installed on each platform being tracked. Q version 1.0 provides Diagnostic Engines for ORACLE and Windows 95, NT and 3.X clients. Installing the engine within the ORACLE instance or client PC you wish to track ensures that data collection takes place any time the ORACLE instance is started or the PC booted.

Diagnostic Engines

Data collection takes place any time the ORACLE instance is started or the PC is booted.

For Oracle The Diagnostic Engine for ORACLE consists of PL/SQL packages which are installed within the ORACLE instance. These packages collect and store data locally and provide a common interface which allows multiple Q Viewers to simultaneously query information without incurring the overhead costs of multiple sessions.

For Client The Diagnostic Engine for Windows 95, NT and 3.X is a small process which is installed on each client you wish to probe or communicate with. The client side engine is a passive process which listens for messages from the Viewer on a TCP/IP socket. This process also collects and stores performance information on a regular basis, to provide a historical perspective when the Viewer probes the client.

2 Installation and Set Up

OVERVIEW

The Q Diagnostic Center requires the presence of certain software before the Viewer and Diagnostic Engine for ORACLE and the Client can function properly. We suggest that you conduct the following tests, before installing Q, to ensure your software is configured properly. If these tests do not work, please follow the suggestions in the Appendix B - Common Installation Problems, before contacting Technical Support.

WORKSTATION

The PC where you will be viewing and diagnosing with Q.

Requirements

Q Viewer	Install Client Engine Color display adapter (1024x768) Memory: 32 Mb Disk space: 32 Mb free Oracle SQL*Plus (32 Bit) Oracle SQL*Net
Client	Windows 95, NT or 3.X TCP/IP Disk space: 3 Mb free

Pre-tests

Q Viewer	TCP/IP	In a DOS Window type ping 127.0.0.1
	SQL*NET	Connectivity: Use SQL*PLUS to connect to desired instance
Client	TCP/IP	In a DOS Window type ping 127.0.0.1

Environments

Q will install quickly and with minimum effort if you take 5 minutes to check your environment.

ORACLE INSTANCE

The Oracle Database Instance you will be tracking with Q

Requirements

ORACLE 7.2 or higher
Tablespace with 10MB free
ORACLE Job Queue Process active

Setup and Test

Verify that the DBMS_SHARED_POOL package is created.
Execute d:\pooltest.sql

If DBMS_SHARED_POOL not installed

connect as SYS & execute the following scripts in order:
<ORACLE_HOME>\rdbms\admin\dbmspool.sql
<ORACLE_HOME>\rdbms\admin\prvtpool.plb

Modify INIT.ORA parameters

JOB_QUEUE_PROCESSES	= n	(recommend n >= 2)
JOB_QUEUE_INTERVAL	= m	(recommend m = 60)
TIMED_STATISTICS	= TRUE	(recommended)

Start the Oracle Job Queue process
SHUTDOWN & STARTUP the ORACLE instance

CLIENT DATA PATH

The Diagnostic Engine for the Client logs information to a common drive. All clients must be able to both read and write to this area. We suggest creating a standard drive mapping [Q:] to a network server which is available at all times.

Client Data Path

Q will not function properly without a Client Data Path.

NETWORK STAGING AREA

The Network Staging area is not required. The install procedure provides an option for copying the CD image to a sharable device, allowing you to run future installs over the network rather than from CD.

WHAT DO I INSTALL WHERE? Where each component of Q should be loaded and their requirements.

Win 95, NT

Q Viewer
Installs in 5 minutes
Requires: Diagnostic Engine for Client to be installed on same box.

Oracle

Q Diagnostic Engine for ORACLE
Installs in 20 minutes
Requires: SYS password
Tablespace with 10Mb of free storage
Oracle Job queue started
Enable timed statistics (recommended)

Win 95, NT, 3.x

Q Diagnostic Engine for the Client
Installs in 2 minutes
Requires: Access to a shared network drive
Local C drive will work but not enable this PC to view other clients.

INSTALL PROCEDURE

Insert the Q CD in the appropriate drive. Q install should start automatically otherwise:

In the Program Manager, Select Run.

In the Command Line type [drive]:\setup <ENTER>

At the Welcome Screen <NEXT>

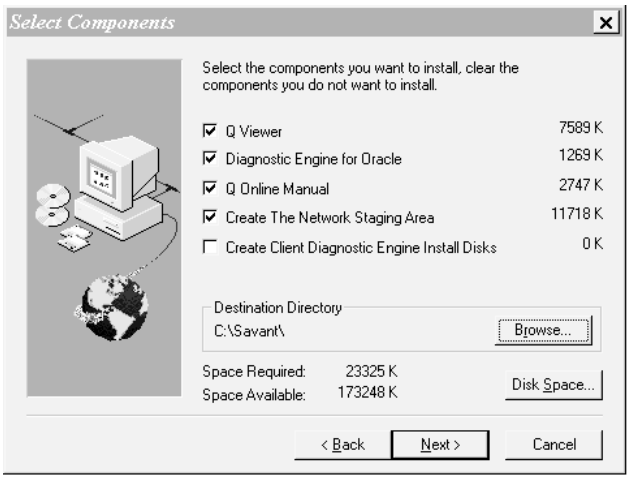
The License Agreement Screen outlines Q's restrictions. You have the choice to accept or not. If you do not accept - setup will close, if you accept <ACCEPT>

At the User Information Screen enter your 10 digit serial number found on the inside back cover of the manual <NEXT> or

If you do not have a serial number, call Savant's Customer Service [800.956.9541].

Automated Install

Please verify the required software is present and configured so the install will run smoothly.



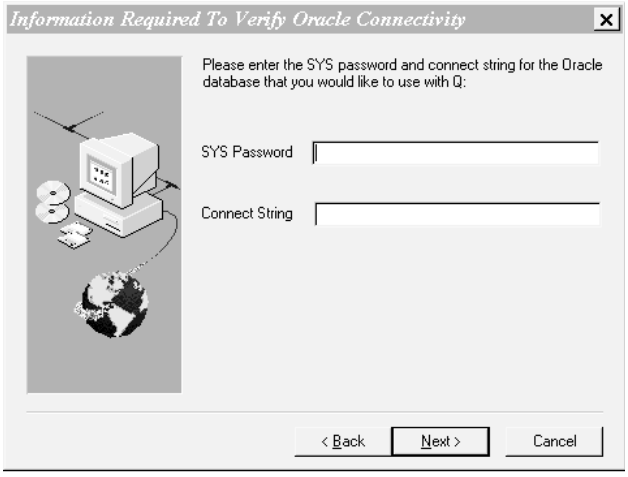
At the Select Components screen follow the instructions to select/deselect components for your install.

If the 'Create Network Staging Area' is selected, all installation files from the Q CD will be copied to the destination network directory. This will allow future installations of Q to be launched directly from the network directory.

If the option to 'Create Client Diagnostic Engine Install Disks' is selected, three formatted disks are required

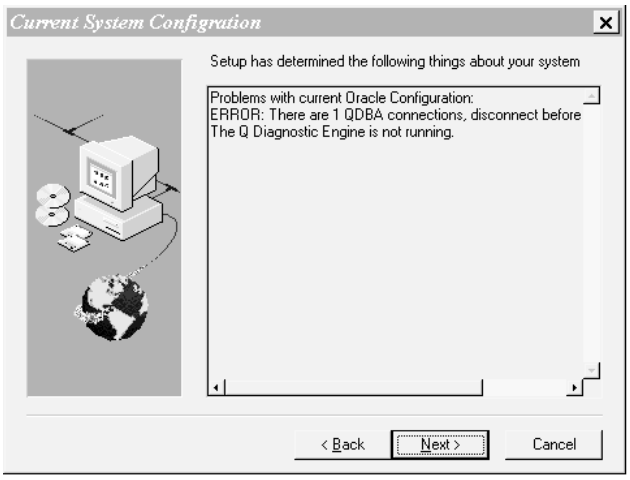
Diagnostic Engine for Client Disks

3 formatted 3.5" diskettes are required to create Diagnostic Engine for Client disks.

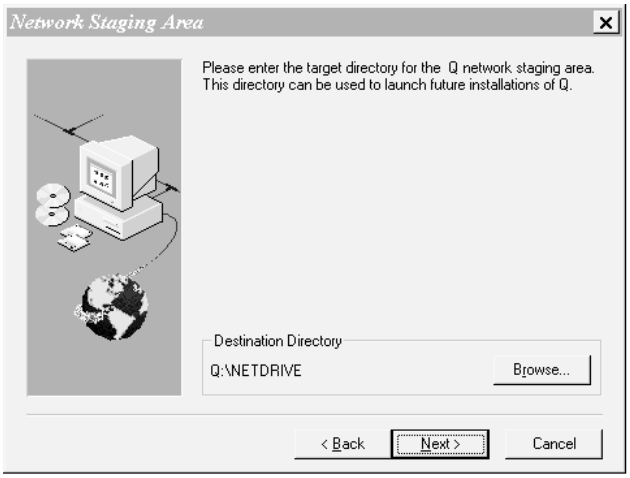


Enter your password for your SYS account and database connect string.

If setup detects problems with your ORACLE configuration the Current System Configuration screen displays a list. Install will not continue until the problems are resolved.



Q verifies your SYS password and your connect string <NEXT>



The Network Staging Area screen prompts you for a directory for Q's installation files.

Network Staging Area

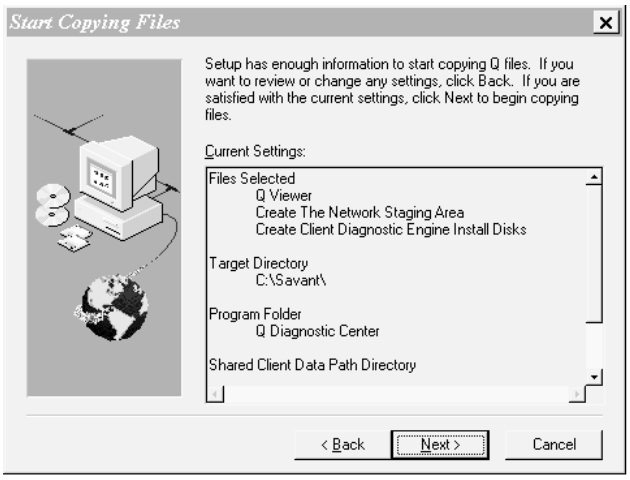
This area allows future installations of Q to be launched directly from your directory.

If a directory does not exist - setup will ask if you want to create one <NEXT>

At the Select Program Folder screen, type folder name where Q will be installed or accept default 'Q Diagnostic Center' <NEXT>

The Start Copying Files screen allows you to view and/or change any settings before copying begins.

If you are satisfied with the settings <NEXT>



After the files have been copied, Q will

1. Make a program icon group if you are running Windows NT, 3.x
2. Create a Q icon on the desktop for Windows 95 users.

The Q Viewer and (if selected) Network Staging Area have now been successfully installed. If these were your only options the Setup Complete Screen appears giving you the option of viewing the READ ME TEXT file or selecting it later from the Q program group. <FINISH>

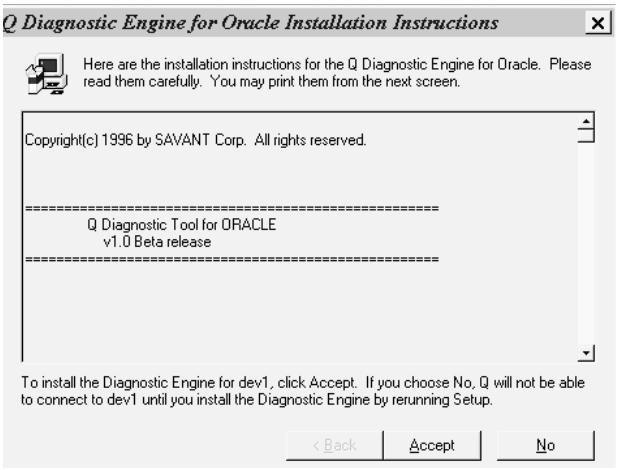
At the completion of the installation you can launch Q from the icon group [Windows NT, 3.x], or from the desktop [Windows 95].

Q' s main screen Instance Overview will be displayed

OR

If you chose the Create Diagnostic Engine Install Disks option you are now prompted for 3 formatted diskettes <NEXT>

If you chose to install the Diagnostic Engine for ORACLE the instruction screen now appears prompting you to read before you install this engine.

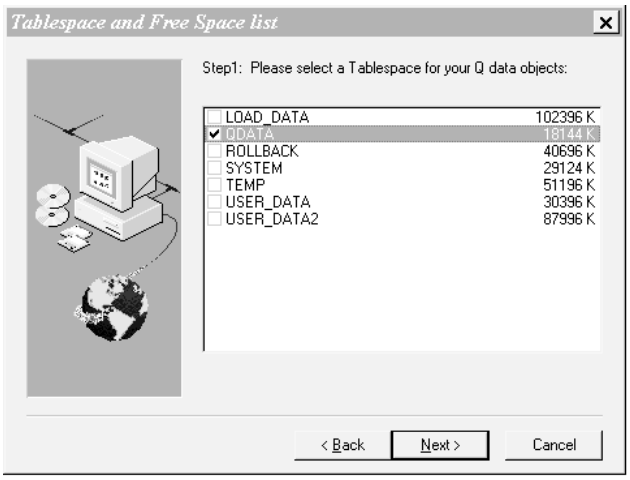


These instructions can be viewed by using the scroll bar on the right.

After viewing instruction <YES>

If you choose <NO>, you will exit install.

The Tablespace and Free Space List screen is displayed.



Select a Tablespace for Q Database objects. Q objects require at least 10M of tablespace area <NEXT>

At the Tablespace for QDBA screen select temp Tablespace for QDBA user <NEXT>

The DOS Window appears checking for all ORACLE dependencies.

If successful the Setup Complete Screen appears <FINISH>

You may launch Q.

Altering QDBA

DO NOT CHANGE the QDBA Password while the Diagnostic Engine for ORACLE is running

THE INSTANCE WILL HANG!

QDBA Password

QDBA password is QDBA. To change the password, STOP the DIagnostic Engine for ORACLE, then ALTER the QDBA user.

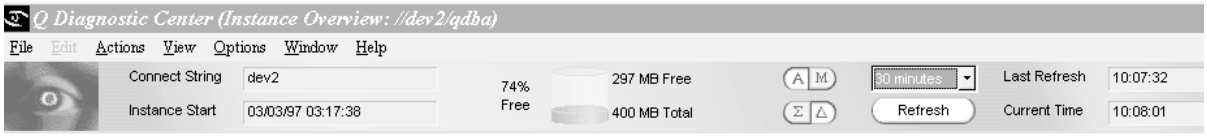
DIAGNOSTIC ENGINE FOR CLIENT

The Client Diagnostic Engine can be installed from the Network Staging Area or from the diskettes made during the initial installation. To install from the Network staging area,run Q:\setup, where Q:\ is mapped to the root of the Network Staging Area. To install from diskette, place disk 1 in drive A: and run A:\setup

3 Looking Under Q's Hood

CONTROLLING THE SCREEN DISPLAY

Explains how Q displays statistics and how often the screen will be updated



Refresh Modes

Q supports automatic and manual refresh modes. The active button will be down and light while the inactive button will be raised and darker.

A M

Automatic
By default, the Q Viewer starts in automatic mode, refreshing the screen at set time intervals.

A M

Manual
Manual mode stops automatic refreshes - requiring you to depress the REFRESH button to display new statistics on the screen.

Refresh

Refresh
The Refresh Button refreshes the screen with current statistics.

Q Buttons

Active buttons are depressed and light.

Inactive buttons are raised and darker.

Calculation Modes

The Q Diagnostic Engines calculate statistics from two perspectives.

Σ Δ

Sigma
Cumulative statistics

Σ Δ

Delta
Difference between current and previous collection cycle

REPLAY VIEWER Play back Instance Overview's history including certain detail lists.

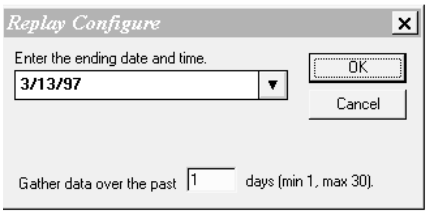
Activate the replay Viewer by clicking on the icon at the far right of the top toolbar or through the menu by selecting Replay under Options.

Enabling Replay

To use the Replay Viewer, the Diagnostic Engine for ORACLE must be configured to collect and store historical data. See the next section (page 18), for instructions on how to configure the Diagnostic Engine for ORACLE to collect historical data. If no historical data has been collected, the Replay Viewer will contain no data points.

Configuring Replay Viewer

By default, the Replay Viewer is configured to display activity over the past 24 hours. To see more than the past 24 hours, press the Configure button on the Replay Toolbar.



Invalid Dates

If an invalid date is entered, Q will not accept the request.

The replay Viewer configuration screen works in reverse logic. Enter the date of the last day you want to view data for. By default this is the current date. Next enter the number of days back, that you want to view (ie choosing the current date and 1 day - will display the past 24 hours). Enter dates by expanding the date field into a calendar.

Using Replay

Initiating Replay splits the top toolbar into two windows which show past System Performance information. The bottom window displays all of the data points collected for the period specified in Replay Viewer configuration. The scrollable area in the lower window highlights a 6 hour period, which is detailed in the top window.

Scroll through the data in the bottom window. Click on a data point in the top window. The Instance Overview screen now displays the state of the database at that point in time. You may drill down and see detailed lists for:

Dictionary Cache	Data Files
Library Cache	Redo Log Files
Latch Get Miss Ratio	Session Wait List
Time to Failure	System Performance

Walking Through the Data

The Replay Viewer works similar to a VCR. The buttons on the Top toolbar cause the Viewer to start walking through each collection point.


Manually step forward


Automatically step forward


Stop automatic stepping


Steps back to first data point

The Step and Rate area of the Top Toolbar configure how quickly the Replay Viewer steps forward/backward and how many data points it steps over.

Replay Graph

If the Diagnostic Engine is not scheduled to collect data the graph will show a break in the data points.

Step

The period of time between the current data point and the next data point Replay will display. Choosing "ALL" forces the Replay Viewer to walk through each data point collected.

Rate

How long the replay Viewer will pause before advancing to the next point.

Instance Down

The Top window will fill red for the period the instance is down.

Replay Collection OFF

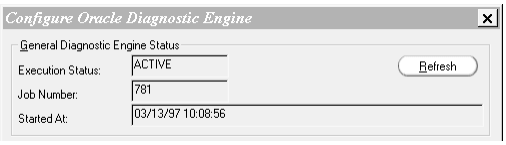
The Bottom and Top windows will be blank during periods the Replay collection is disabled.

CONFIGURING THE DIAGNOSTIC ENGINE FOR ORACLE

The Diagnostic Engine for ORACLE is a collection of PL/SQL packages which run in the ORACLE job queue. The Engine (1) collects and stores data for calculating Q statistics (2) tracks segment growth in the database enabling Q to predict Time to Failure and (3) collects and stores data for the Replay Viewer.

The Diagnostic Engine Configuration screen is divided into three sections.

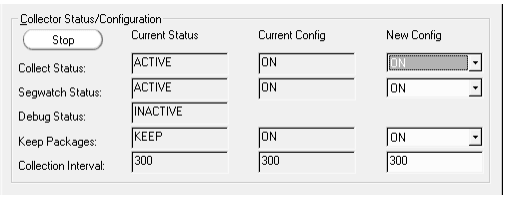
Top Section



Displays the current status of the Diagnostic Engine for ORACLE

Middle Section

Provides the ability to configure how often the Engine collects data and enabling/disabling segment watching. The segment watch routine should be executed less frequently on systems with a large number of segments and disabled if there are more than 2000 segments.



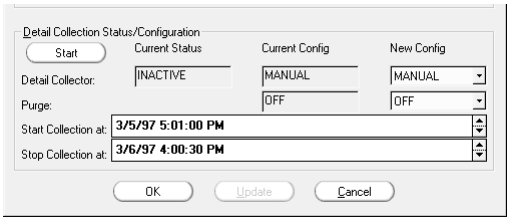
Segment Watch

Disable segment watching if your instance contains more than 2000 segments.

Bottom Section

Configures the collection of Replay data. Replay collection has three modes:

Replay: Continuous — 24 hrs a day between specified Start and Stop dates
Replay: Daily — During specified hours of the Day
Replay: Manual — 24 hrs a day until Stopped or instance is restarted



Purge	Forces the collector to purge its data tables when the collector is started. The frequency of the purging operation is determined by the current replay mode.	
Purge: Continuous	Once, at the start date and time	
Purge: Daily	Daily, at the Start time	
Purge: Manual	Once, when Replay collection is started	
Stopping Replay Collection	Enter Manual mode and press the STOP button. This button only appears when in Manual mode.	
Starting Replay Collection	Continuous	Enter valid start and stop dates and times Press the UPDATE button.
	Daily	Enter valid start and stop date and times. Dates are ignored. Press the UPDATE button.
	Manual	Press the START button. Date and times ignored.

Q'S STATISTICS

The basis of the Q system is statistical analysis. From a technical perspective, Q is a complex statistician which displays its findings through a series of customized controls. In order to understand the controls, you must understand how Q views and uses the statistics.

Averages

Averages or norms are the heart of Q mathematics. For every statistic the Diagnostic Engines collect, Q calculates an average for these statistics, over a set time period.

Trend Types

These time periods are referred to as trend types, of which there are five in the version 1.0 release.

Past hour, current day
Same hour, yesterday
Same hour, last 30 days
Same hour, same day, last 30 days
Last 24 hours

Normal Range

Q looks at all collections for a given event, for the specified period of time. The normal range is the area where most of the collections fall. If most of the collections fall very close to the average, then there is a small variance in your work load. i.e. all the applications on your database do similar work. If the collections are spread over a wide area away from the average, then there is a large variance in your workload. i.e. your database handles applications which stress this statistical event.

Current Value

The actual value of the statistical event at the last collection cycle.

Q Sum

The Qsum evaluates your collections for the past hour and assesses whether, as a whole, your performance has gotten better or worse. If the majority of your collections were better than average, then you are getting better - producing a positive Qsum. If the majority of the collections are below average, you have a negative Qsum.

CONTROLS

The Q controls are designed to communicate Q's statistical knowledge in a simple and easy to understand fashion. At a minimum, all controls display an average performance level and the last value collected by the Diagnostic Engine.

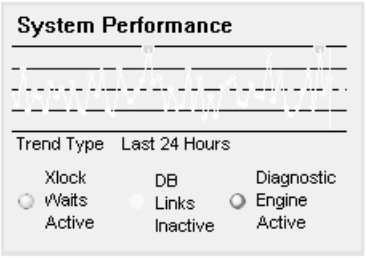
Hit Ratio

A perfect hit ratio would be 100%, signifying that ORACLE found all data required for current processes in memory - rather than going to disk.

Hit Ratio

The Hit Ratio Control provides a quick assessment of how the SGA caches are performing. The components of the Hit Ratio Control are:

Horizontal line	Percentage of data found in cache
Vertical line	Current Hit / Miss ratio
Yellow Ball	Qsum = Performance trend over past hour If performance has been better than average the ball is above the horizontal axis. If worse than average, then it is below the axis.
X on horizontal line	Average over trend period
Shading around X	Normal operating range Width = variance in processing load low variance = small circle high variance = large circle

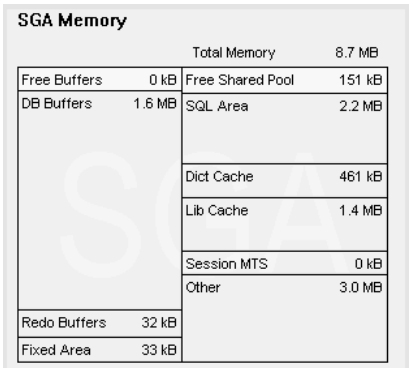


Benchmark Control

Provides an immediate assessment of whether the system is actually slow.

Performance Graph

The System Performance graph demonstrates whether your database is SLOW. The display shows the results of Q benchmarks which are running all of the time. The dotted line is the average time it takes the benchmark to execute. The line above and below the dotted line provide your normal operating range. If the benchmark process is taking longer to run then normal - then your database is performing poorly, and a Red dot will appear on the data point.

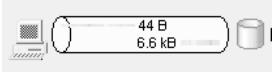


Volume

The Volume Control is used to display memory allocation and physical space allocation within the database. In both cases, free or available space is displayed in a lighter color. The Volume Control used to display SGA allocation provides the ability to drill down within each cache to gather detailed statistics.

Activity

The Activity Control provides a visual assessment of singular events which affect overall system performance, such as the number of active processes. The control provides fill which represents current activity and a vertical line which represents the average activity level for this event. The fly over detail contains the peak and normal ranges for this event as well.



Network Tube

The Network Control provides a quick assessment of the volume of traffic being received and sent by the client or database. The icons to the left and right of the tubes identify the resource which is either creating or accepting network traffic. The light channels within the tubes become thicker as volume increases and thinner as volume decreases. The Instance Overview screen provides a series of tubes, which display the volume of traffic caused by all clients, and the volume of data being accessed from remote databases via database links.

Queues

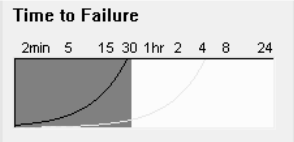
The Queue Control is used to portray how the various Queues within the ORACLE database are performing. The cone provides a picture of how many events are passing through the queue. The neck displays how long the average entry must wait. As the wait period increases, the fill color graduates through white, yellow and red.

Cone

y axis	Range	process entering queue/min
Horizon hash line	Average	over trend period
Speckled Fill	Current	activity

Neck

y axis	Range	average wait time per entry
Horizontal hash line	Average	over trend period
Solid Fill	Current	activity measured against average



Time to Failure

Measuring growth rate of segments in database - predicts the time segments will run out of space to grow within 24 hour period.

Time to Failure

The Diagnostic Engine for ORACLE constantly watches all growing segments for block allocation, and calculates a rate of growth and a time to failure for each segment at the current rate of growth. The Time to Failure control charts a predicted time for pending segments which have been identified as candidates for failure. The control provides a visual alert, by turning red, when a segment is predicted to fail within 30 minutes or less. The control provides drill down access to detailed information on all failing segments

UTILITIES

The Q utilities are designed to place your data processing world at your fingertips, without having to leave your desk.

Broadcast 

The Broadcast utility, which is available from any screen, provides a quick method of contacting clients, when you need to take down the database. The utility provides an editor for creating a message and a list of all current sessions. Select all or specific sessions to notify and hit the send button. The message which you have typed will pop up on the screen of all the remote clients you selected

Chat with PC 

The Chat with PC utility is accessed from within PC Viewer. The utility allows you to have an interactive dialog with the PC you are currently viewing. Each dialog message is limited to 128 characters.

Kill Session 

The Kill Session utility can be accessed from within Session Detail. The utility allows you to kill the ORACLE session which Q's Session Detail is actively probing. This utility is most helpful when the PC Viewer has identified dead sessions or when two or more sessions are contending for the same resource, and you need to clear the resulting lock contention.

Killing sessions can not be UNDONE. Be certain that you really want to terminate the session before finalizing the Kill process.

Find and View File 

The Find File utility can be accessed from within PC Viewer. The utility allows you to search a remote client and all drives it is attached to for specific files. Find File will search the search path for a given file and return a list of all copies of the file including version, size and date information. Find File is useful for locating duplicate installations or quickly finding and viewing configuration & log files - such as SQLNET.log.

Database Connect 

The Database Connect utility allows you to initiate a connection to a database on a remote PC. This utility allows you to test ORACLE connectivity remotely. Connection status is returned, including all ORACLE error messages.

Registry Editor 

The Registry Editor allows you to view the Registry of remote PCs. Windows 95 and NT store Environment and Path variables within the Registry. The Q Registry Viewer allows you to quickly verify Registry entries such as ORACLE_HOME.

4 Navigating in Q

Q is a diagnostic tool designed with the DBA in mind. The Screens and Controls are information dense allowing you to see at a glance data other systems have buried two and three levels down. Navigating through the screens is natural, intuitive and easy. With the use of Q's Toolbars and 'Hot Links' you are never more than one or two mouse clicks away from anywhere in the system. Simply put, Q is a tool that saves you time.

TOOLBARS

Q's toolbars aid your navigation through the system in two ways:

(1) The left toolbar allows navigation through your environment.

(2) The bottom toolbar allows navigation within a specific context (Currently Q supports two contexts –ORACLE Instance and the PC).

Left Toolbar

The left toolbar currently has five navigation buttons and one utility button.

Navigation

The PC Viewer and Instance Overview icons establish context. The Back, Forward and Go To icons allow for movement through previously visited screens.

Utility

The Broadcast icon allows for communication with any PC visible to you through the Diagnostic Engine for Client.

Instance Overview		Connect to any ORACLE Instance currently running
PC Viewer		Link directly to client PC
Broadcast		Send messages to all clients attached to the database Q is viewing.
Back		Go back one screen
Forward		Go forward one screen
Go To		Select from a list of all screens traveled thus far

BOTTOM TOOLBAR

The Bottom Toolbar contains navigation buttons as well as Pop-up lists. These lists can be found on either side of the navigation buttons and will be discussed in detail in Chapter 5 - Q Screens.

This toolbar is the same on all of Q's screens within a context. In the context of an ORACLE Instance, the bottom toolbar is a navigational one.

SQL Window	Provides interactive workshop for writing and explaining SQL
Session Detail	Details information on all ORACLE Sessions currently running
Instance Overview	Return to Main Screen
SQL Area Viewer	Window & Workshop into cached SQL statements

In the context of the PC Viewer, the bottom toolbar is a utility toolbar

Registry Viewer	Views registry entries on remote PC
File Locator	Locates files on remote PC
Instance Connection	Connects to ORACLE from remote PC
Chat with PC	Allows interactive dialog with remote PC

HOT LINKS

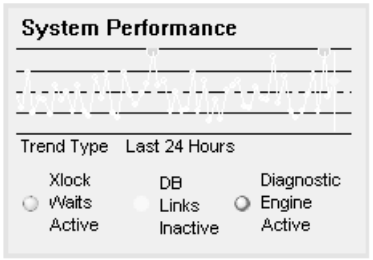
The Q system has three field based hot links. Anywhere these fields appear, you can double click your mouse and link directly to the corresponding screen. These fields appear either on a screen or in a Pop-up list.

Session ID	Session Detail Screen
SQL Statement	SQL Window Screen
Client Machine Name	PC Viewer Screen

5 Q Screens

INSTANCE OVERVIEW

Instance Overview provides a quick at-a-glance look at the performance of an ORACLE7 Instance. The screen is organized around major components or subsystems of an ORACLE7 instance as follows: System Performance, Session Activity, SGA Memory, SQL*Net, I/O Subsystem. The graphical controls are designed to display current activity levels against measured norms, enabling rapid identification of abnormal conditions and diagnosis of performance problems.



Performance Benchmark

The performance benchmark allows the DBA to quickly confirm whether serious performance degradation is occurring in the instance.

System Performance

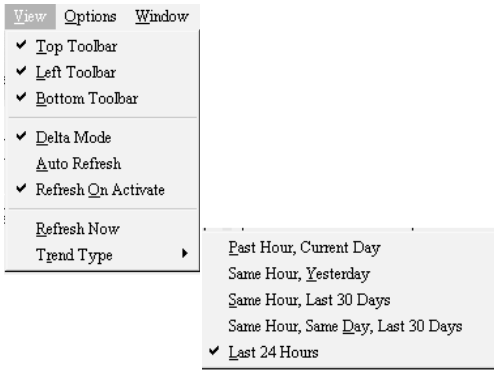
The System Performance area displays a line graph of the Q Diagnostic Engine's performance benchmark results in the last 2 hours. Also displayed are a trend type and three state buttons. The performance benchmark allows the DBA to quickly confirm whether serious performance degradation is occurring in the instance. These three features work in tandem to help you diagnose the system.

Trend Type

Q computes averages for 5 different periods, which we refer to as trend types. Trends are computed for the following periods:

Past hour, Current day
Same hour, Yesterday
Same hour, Last 30 days
Same hour, Same day, Last 30 days
Last 24 hours

The trend type is configured under the View option of the Main Menu.

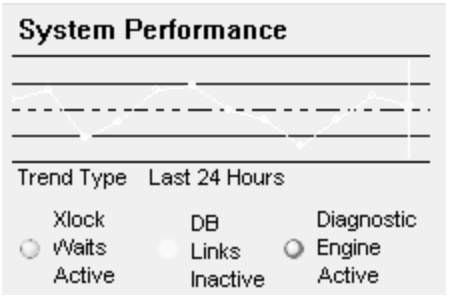


Trend Types

After choosing a trend type, the screen must be 'Refreshed' to reflect the change.

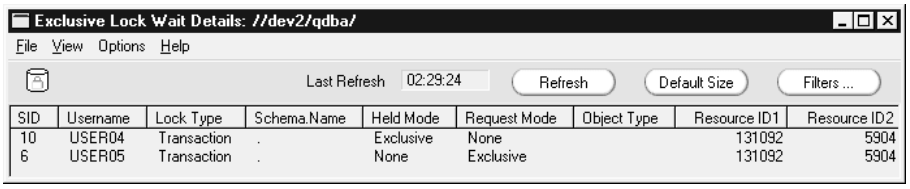
Visual Alert Area

There are three small round buttons just below the System Performance graph. These buttons are blue by default, turning either yellow or red to visually alert you to potential performance problems. The buttons show whether there are processes waiting on exclusive locks, processes which have database links open and the status of the Q Diagnostic Engine process.



XLock Waits - Exclusive Lock Waits

This state button reports if any lock contention currently exists in the database. If contention exists the button will be red. Clicking this button activates the Exclusive Lock Waits Details list. Through the Filters box you have the choice of viewing either All Locks or just Contention Locks



The Exclusive Lock Wait Details List provides the following information:

Session ID	Request Mode
Username	Object Type
Lock Type	Resource ID1
Schema Name	Resource ID2
Held Mode	

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

Double click on any line in the detail box to go directly to Session Detail Screen (Session ID Hot Link).

The DB Links state button informs you whether any database links are currently open in the instance. The state button is yellow if there is any traffic across information links.

Clicking this button activates the Database Link List providing the following information:

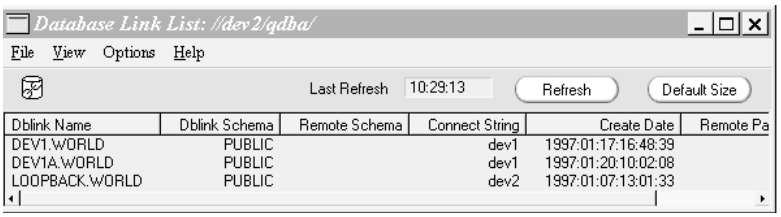
DBLink Name	Connect String
DBLink Schema	Create Date
Remote Schema	Remote Password
Isopen	

DB Links

If there is any traffic across information links, the state button will be yellow.

DB Links - Database Links

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.



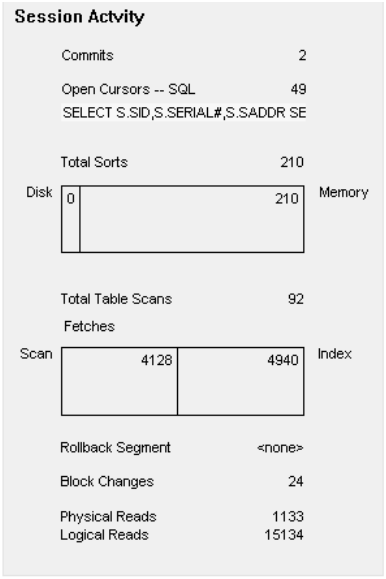
Diagnostic Engine

The Diagnostic Engine state button informs you whether the Diagnostic Engine for ORACLE is:

currently running	Blue
not running (or is waiting in job queue)	Red
uncertain	Yellow

Session/Segment Activity

The Session/Segment Activity area of the screen provides you with information about levels of user activity in the database. The four Activity Controls provide a visual assessment of singular events which effect overall system performance. This can help determine whether user activity is unusually heavy, as a plausible explanation for degraded performance. Placing your cursor over any of the Activity Level Controls will display the statistics for the Current, Peak, Average and Normal Range of that control process.

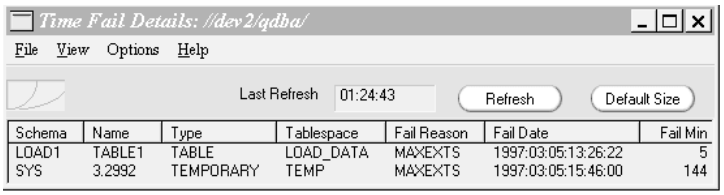


Activity Controls

The four Activity Controls provide a visual assessment of singular events which effect overall system performance.

Time to Failure

Time to Failure is one of Q's unique features. Measuring the growth rate of segments in the database, the Diagnostic Engine for ORACLE projects the time the segments will run out of space to grow within a 24 hour period. If a segment is predicted to fail within 30 minutes or less, the graph will turn red indicating a critical status. Detailed information on all failing segments can be obtained by positioning your mouse over the graph and clicking.

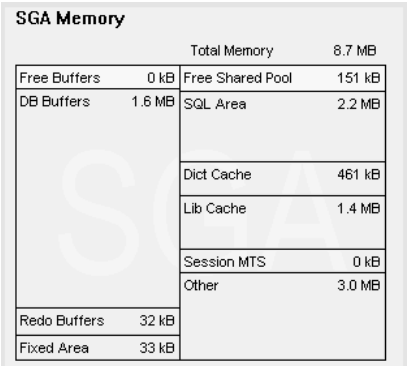


Schema	Name	Type	Tablespace	Fail Reason	Fail Date	Fail Min
LOAD1	TABLE1	TABLE	LOAD_DATA	MAXEXTS	1997:03:05:13:26:22	5
SYS	3.2992	TEMPORARY	TEMP	MAXEXTS	1997:03:05:15:46:00	144

SGA Memory

The SGA memory area provides you with data on all allocated and unallocated memory within the current database. In both cases free or available space is displayed in a lighter color.

The Volume Control used to display SGA (System Global Area) memory allocation provides the ability to drill down within each cache to gather detailed statistics. Simply position your mouse over the cache and click.



Detail Drill Down

The cursor changes into a pointing hand over all controls which provide detailed statistics.

The information provided in the Dictionary Cache Detail box includes:

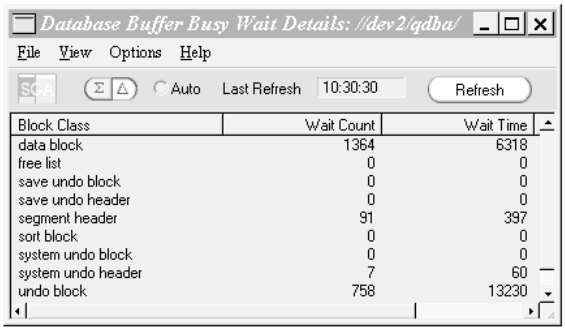
- Cache ID
- Cache Name
- Usage
- Gets
- Get Misses
- Get Hit Ratio

The information provided in the Library Cache Detail box includes:

Cache Namespace	Pins
Shared Pool Memory -KB	Pin Hits
Gets	Pin Hits Ratio
Get Hits	Reload
Get Hit Ratio	Reload/Pin Ratios

Clicking the title bar of any of these fields will sort that field in either ascending or descending order.

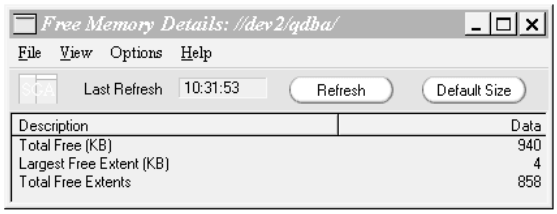
The Volume Control also provides detail lists for the DB Buffers Box and the Free Shared Pool box. This information can be viewed by clicking over the desired box.



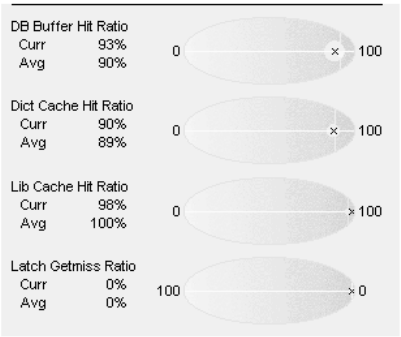
Buffer Busy Waits

When the Buffer Busy Wait count for a block class is constantly increasing this could signal buffer contention in the database.

· Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.



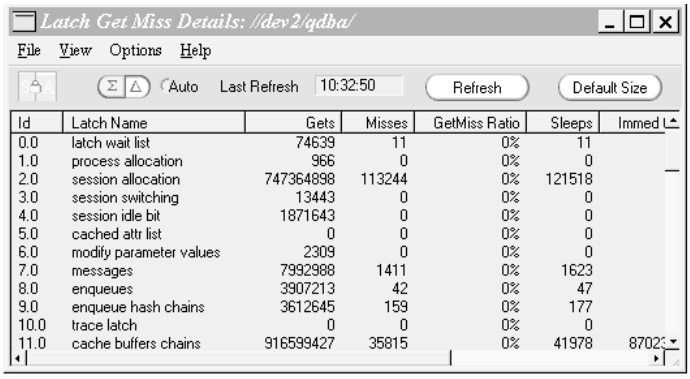
The bottom half of the SGA Memory area displays four Hit Ratio Controls.



Holding your cursor over any of these Controls will produce the fly-over listing the Hit Ratio, Average, Normal Range and Q Sum values.

Clicking on the DB Buffer, Dictionary Cache or the Library Cache Hit Ratio Controls will display the detail boxes described earlier.

Clicking on the Latch GetMiss Ratio Control will display the Latch Details box.



Id	Latch Name	Gets	Misses	GetMiss Ratio	Sleeps	Immed L
0.0	latch wait list	74639	11	0%	11	
1.0	process allocation	966	0	0%	0	
2.0	session allocation	747364898	113244	0%	121518	
3.0	session switching	13443	0	0%	0	
4.0	session idle bit	1871643	0	0%	0	
5.0	cached attr list	0	0	0%	0	
6.0	modify parameter values	2309	0	0%	0	
7.0	messages	7992988	1411	0%	1623	
8.0	enqueues	3907213	42	0%	47	
9.0	enqueue hash chains	3612645	159	0%	177	
10.0	trace latch	0	0	0%	0	
11.0	cache buffers chains	916599427	35815	0%	41978	87023

Hit Ratio Control

A perfect hit ratio would be 100%, signifying that ORACLE found all data required for current processes in memory- rather than going to disk.

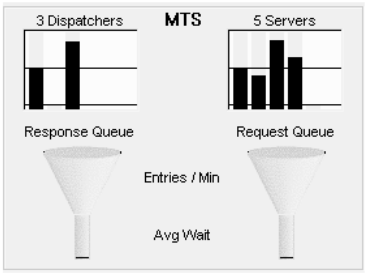
SQL Net Info

The SQL*Net Info area contains information on user connections to the instance, multi-threaded server performance, and traffic volume over SQL*Net.

MTS - Multi Threaded Server

The MTS Servers Control shows how many multi-threaded servers are currently running and individual busy rate for each server.

The MTS Dispatchers Control shows how many multi-threaded dispatchers are currently running and individual busy rate for each dispatcher.



Response Queue

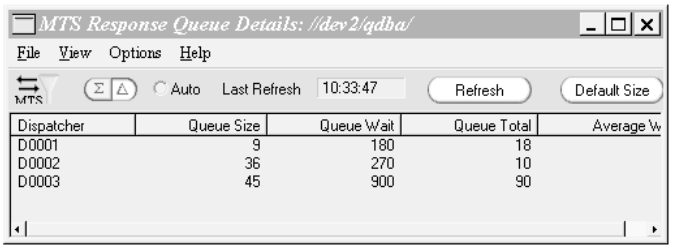
This control shows throughput and average wait information for the MTS response queues.

Corresponding to the Dispatcher Display is the Response Queue Control, and to the Server Display is the Request Queue Control.

The Response Queue Control shows throughput and average wait information for the MTS response queues.

Clicking over the Response Queue Control will produce the MTS Response Queue Detail box . Information provided in this box includes:

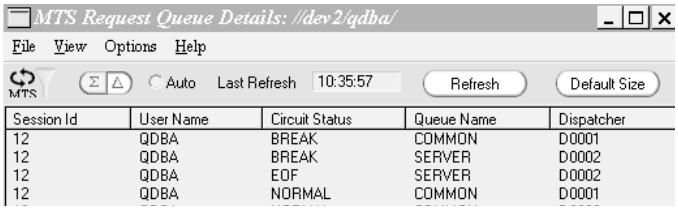
Dispatcher	Queue Wait
Queue Size	Queue Total



The Request Queue Control shows throughput and average wait information for the MTS common request queue.

Clicking your mouse over the Request Queue Control will display the MTS Request Queue Detail box. Information provided in this box includes:

Session ID	Queue name
User Name	Dispatcher
Circuit status	



Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

The Refresh Button will return the list to its previous order.

Double click on any line in the detail box to go directly to the Session Detail Screen (Session ID Hot Link).

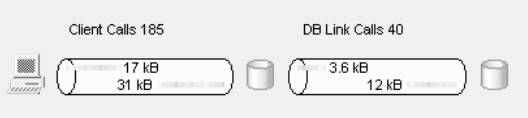
Holding your mouse over either of the Queue Controls will provide you with the following information:

Queue Value	Wait Value
Mean	Mean
Normal Range	Normal Range

MTS Request Details

The MTS Request Queue Details shows the current status of all user sessions currently connected through the Multi-Threaded Server.

The last part of the SQL*Net Info area contains two Network Controls. These two Network Controls display the volume of SQL*Net traffic in which the instance is participating. The Client Control displays traffic to and from the instance and all client machines (usually PCs). The DB Link Control displays traffic to and from the instance and other instances over database links. Above each Control is a display of the number of messages sent.



The top bar inside the Client Control conveys how much information is being sent from the PC to the Server and the bottom bar conveys how much data is being sent from the Server to the PC. In the DB Link Control the top bar conveys how much information is being sent from the Instance to the Server and the bottom bar shows how much data is being sent from the Server to the Instance.

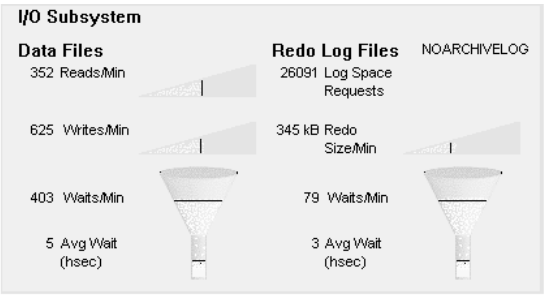
Holding your cursor over the Network Controls will display the actual number of bytes of information sent and received.

I/O Subsystem

The I/O Subsystem area is designed to give diagnostic information on the performance of ORACLE's use of operating system I/O services.

Data Files

The Data Files section shows performance information on I/O activity to the database data files. This area has two Activity Controls and one Queue Control associated with it. Physical read and write activity levels are shown in the Activity Controls and I/O throughput and average wait information is shown in the Queue Control.



I/O Subsystem

If the queue controls look backed up but the activity controls look normal - there might be an I/O problem outside of ORACLE.

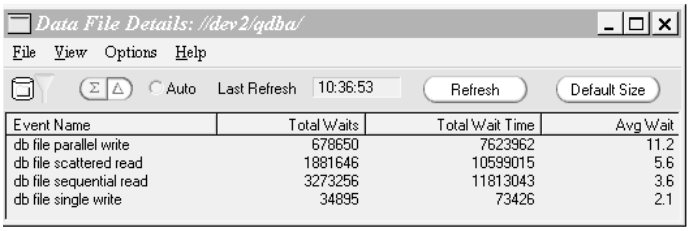
Holding your cursor over either one of the Activity Controls will show the Current, Peak, Average and Normal Range for that control.

Holding your cursor over the Queue Control will show:

Queue Value	Wait Value
Mean	Mean
Normal Range	Normal Range

Clicking on the Queue Control will display the Data File Detail List.

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.



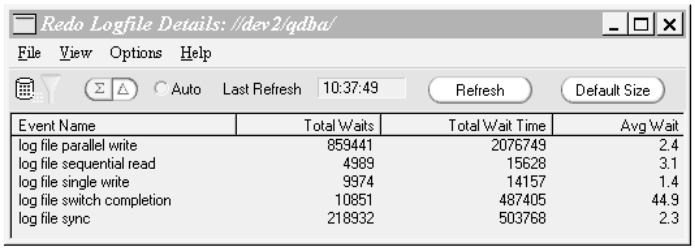
Redo Log Files

The Redo Log Files section shows performance information on I/O activity to the redo log files. The current volume of log data being generated is shown in an Activity Control and log file I/O throughput and average wait information is shown in the Queue Control. Holding the cursor over the Activity Control will show the Current, Peak, Average and Normal Range.

Holding your cursor over the Queue Control will display:

Queue Value	Wait Value
Mean	Mean
Normal Range	Normal Range

Clicking on Queue Control will display the Redo Log Files Detail List.



Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

INSTANCE POP-UP LIST

Along with the navigation buttons on the bottom toolbar of the Instance Overview Screen are three groups of pop-up lists. They are the Session group, Activity group and the Objects group.

Session Group

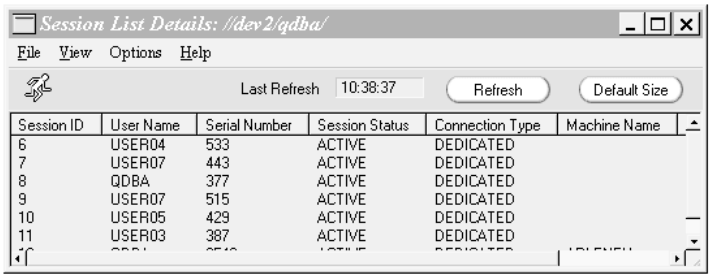
The Session group located at the far left side of the bottom toolbar includes the Session List, Session Wait List and the Hog Session buttons.

Session List

List of all sessions currently attached

The Session List button activates the Session List detail box. You are provided the following information:

Session ID	Connection Type
User Name	Machine Type
Serial Number	Connect Time
Session Status	



Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

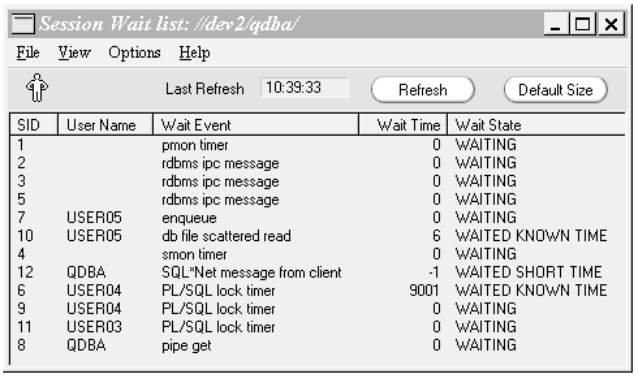
Double click on any line in the detail box to go directly to the Session Detail screen (Session ID hot Link).

Session Wait List

List of all current wait events

The Session Wait List button activates the detail box for all waiting sessions. The user is provided the following information:

Session ID	Wait Time
User Name	Wait State
Wait Event	



TIP

When users are hanging...Session Wait List is a good place to begin diagnosing the cause.

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

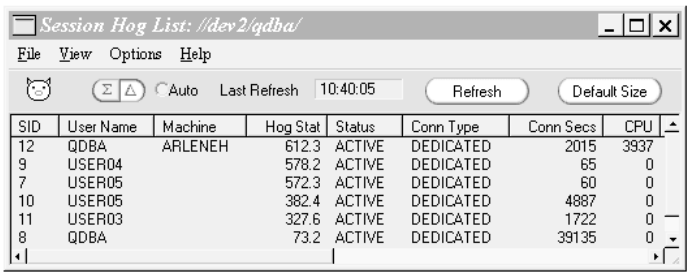
Double click on any line in the detail box to go directly to the Session Detail screen (Session ID Hot Link).

Hog Sessions

List of top ten resource consumers

The Hog Sessions button activates the Session Hog List detail box. The user is provided the following information:

Session ID	Physical Reads
User Name	Block Changes
Machine	Disk Sorts
Hog Status	Block Gets
Status	Connection Gets
Connection Type	Idle Gets
Connection Seconds	Serial #
CPU	



SID	User Name	Machine	Hog Stat	Status	Conn Type	Conn Secs	CPU
12	QDBA	ARLENEH	612.3	ACTIVE	DEDICATED	2015	3937
9	USER04		578.2	ACTIVE	DEDICATED	65	0
7	USER05		572.3	ACTIVE	DEDICATED	60	0
10	USER05		382.4	ACTIVE	DEDICATED	4887	0
11	USER03		327.6	ACTIVE	DEDICATED	1722	0
8	QDBA		73.2	ACTIVE	DEDICATED	39135	0

Hog Sessions

The Hog Stat field is a composite measure of each session's resource consumption.

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

Double click on any line in the detail box to go directly to Session Detail Screen (Session ID Hot Link).

Activity Group

The Activity group includes the Lock button, Rollback Segments button and the Temporary Segments button.

Lock 

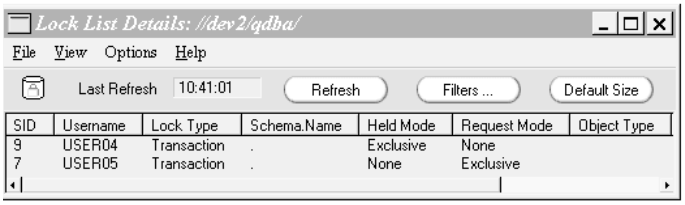
List of all active locks

The Lock button activates the Lock List detail box. Through the Filters button, you have the choice of viewing All Locks or just Contention Locks and you can pick either a specific session or All Sessions. You must 'Refresh' the screen for your choice to take effect. Information provided in this detail box includes:

Session ID	Request Mode
Username	Object Type
Lock Type	Resource ID1
Schema Name	Resource ID2
Held Mode	

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

Double click on any line in the detail box to go directly to Session Detail Screen (Session ID Hot Link).

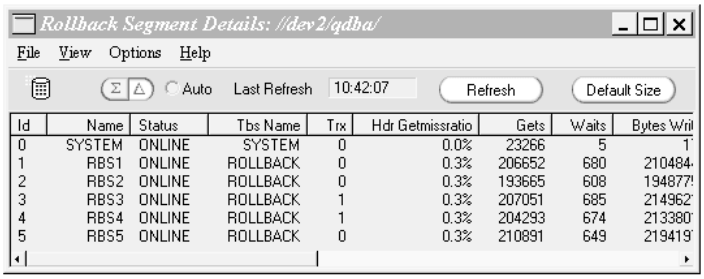


Rollback Segments 

Rollback Segments List of all rollback segments

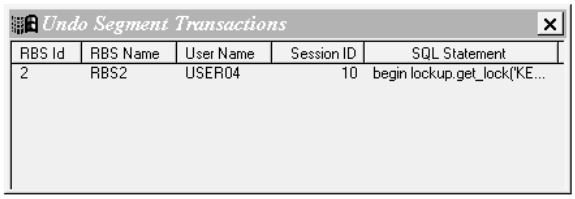
The Rollback Segment detail box provides the user with information on the following:

ID	Highwater KB
Name	Average Active KB
Status	Average Shrink KB
Tablename	Optimal KB
Transaction	Shrinks
Header GetMissRatio	Extents
Bytes Written	Maximum Extents
Size KB	



Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

Double click on any line in the detail box to view the Undo Segment Transactions List.



Double click on any transaction to go to the Session Detail screen. (Session ID Hot Link)

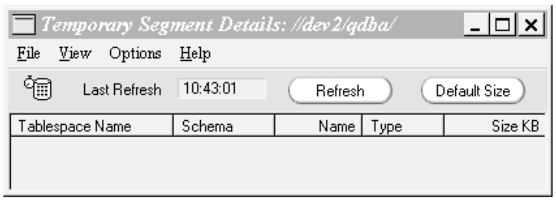
Temporary Segments

List of all temporary segments

The Temporary Segment detail box provides the user with information on the following::

Tablespace Name	Type
Schema	Size KB
Name	

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.



Objects Group

The Objects group includes the Segment List button, Synonym List button, Datafile List button and the Database Links button.

Synonym List

List of all synonyms

The Synonym List button activates the detail box for the Synonym List. You can view specific data based on the criteria you enter in the filter boxes. You must 'Refresh' the detail box for the filters to take effect.

Information provided in this box includes:

Synonym Name	Table Schema
Schema	DB Link
Table Name	

Segment List

List of all database objects

The Segment List button activates the detail box for the Segment List. You can view specific data based on the criteria you enter in the filter boxes. You must 'Refresh' the detail box for the filters to take effect.

Information provided in this box includes:

Schema	Type
Name	Size KB
Tablespace Name	

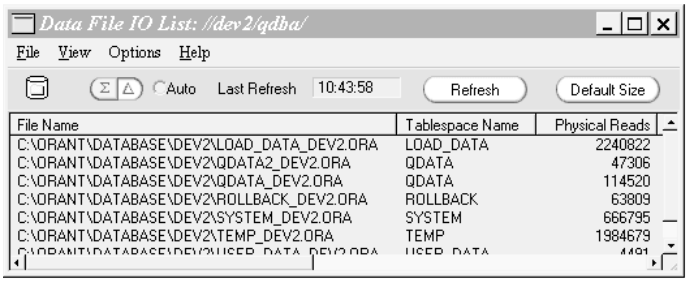
Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.

Data File List

List of database files & associated I/O

The Data File List button activates the detail box which shows the Number of Datafiles, the Maximum Datafiles and the Multiblock Reads. The following information is also available:

File Name	Block Writes
Tablespace Name	Average Block/Read
Physical Reads	Average Block Writes
Physical Writes	Block Reads/Minute
Block Reads	Block Writes/Minute



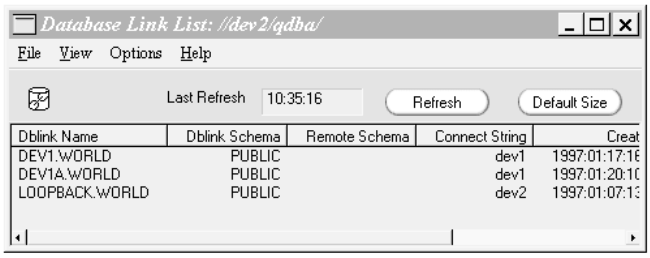
Database Links

List of public database links

Information provided in this box includes:

DBLink Name	Create Date
DBLink Schema	Remote Password
Remote Schema	ISOpen
Connect String	

Clicking on the title bar of any of these fields will sort that field in either ascending or descending order.



SESSION DETAIL

The Session Detail screen displays as much information as possible about a current user's database connection, or session. When performance problems are isolated to one or a few users, this screen allows diagnosis of user-specific issues. To access this screen you activate the Session Detail List and select the appropriate user. This can be done either by clicking the Session Detail Icon on the bottom toolbar or through the top menu bar -

Actions > Server> Sessions > Session List

There are six components to this screen and they are organized as follows: Session Status, Session Activity, Session Information, Memory, SQL*Net Info, and Contention.

Session Detail

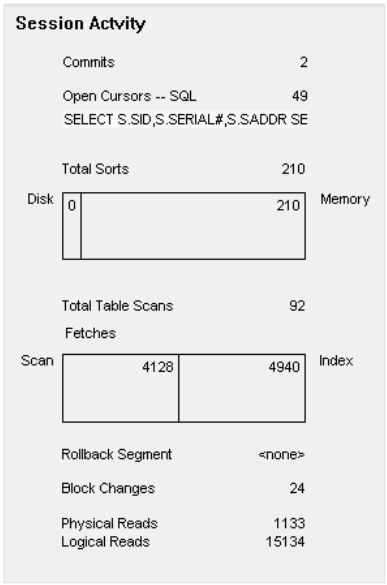
When performance problems are isolated to one or a few users, this screen allows diagnosis of user- specific issues.

Session Status

The Session Status area shows whether the user session is ACTIVE, INACTIVE or KILLED.

Session Activity

The Session Activity area shows information on what kind of data access activity the user is doing in the database, including all open SQL cursors, sort activity and table scan activity. This area has three specific sections to it. The top portion provides information on the number of commits and the amount of open cursors or SQL Select Statements. The bar below this information allows you to actually view all the open SQL Select Statements for the current session. Positioning your cursor on this bar transforms the cursor into a magnifying glass and with a single mouse click all the open cursors can be viewed. Double clicking on a specific open cursor will take you to the SQL Window Screen (SQL Statement Hot Link).



The middle portion of this area shows the Total Sorts Control and the Total Table Scans Control. These Controls are similar to the Volume Control (see Controls - Chapter 3) but display ratio or relative proportion. The Total Sorts Control shows how the session's sort activity is divided between disk and memory sorts, since excessive disk sorting can degrade performance.

The Total Table Scans Control shows how the session's data access activity is divided between fetching from long table scans vs. fetching through indexes. As with all Q Controls, holding the cursor over the Control will produce the detail information box.

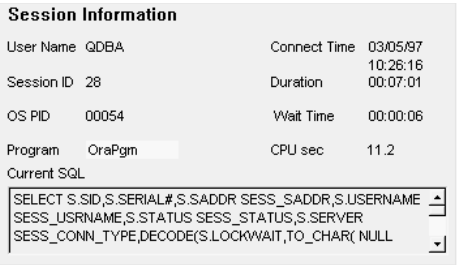
The last section provides the remaining information about the Session's activities. This includes the number of Rollback Segments, Block Changes, Physical Reads and Logical Reads.

SQL Statements

Double clicking on a specific open cursor will take you to the SQL Window Screen.

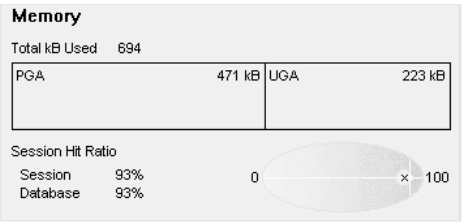
Session Information

The Session Information area shows basic identification information for the session as well as the currently executing SQL statement, CPU used, and cumulative wait time on database events. The current SQL section displays the SQL statement currently being executed. Double clicking on this box will take you to the SQL Window Screen (SQL Statement Hot Link).



Memory

The Memory area shows how the total volume of session memory and the ratio of PGA (Program Global Area) and UGA (User Global Area) memory, in addition to the session hit ratio vs. the database average hit ratio. This information is displayed through two Controls, the Volume Control and the Hit ratio Control.



Session Information

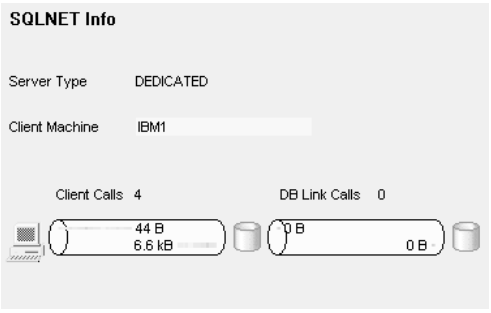
Clicking on the Session ID line will activate the Current SQL box. Double click this box to access the SQL Window screen.

SQL*Net Info

The SQL*Net Info area allows you to see how the user is connected to the instance. It provides you with the Client Machine name and displays the volume of SQL*Net traffic (both client-server and through database links) in the two Network Tube controls.

A single click on the Client Machine name bar (Hot Link) reveals a button to the right. Clicking this button takes you directly to the PC Overview Screen allowing you to view that particular PC.

Positioning your cursor over the Network Tube Control will reveal the Detail Box providing the actual figures for the bytes of information sent by the PC and being received by the Server. The companion Call Boxes for each Network Tube Control display the total number of messages sent and received between the client and the database.



Contention

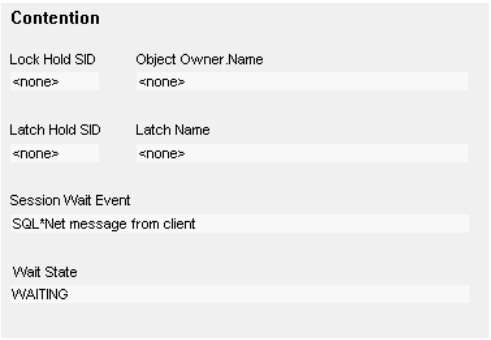
The Contention area allows immediate diagnosis of a session hanging on locks or latches held by other sessions, as well as the current wait event for sessions apparently hung for other reasons. When more than one user is vying for the same resource this module is invaluable. You have at your fingertips the following information:

Contention Module

When more than one user is vying for the same resource this module is invaluable

Lock Hold Session ID and the Object Name and Owner
Latch Hold Session ID and the Latch Name
Session Wait Event and the Wait State

A single mouse click on either the Lock Hold Session ID bar or the Latch Hold Session ID bar will reveal a button to the right. A click on this button connects you to the Session Detail Screen that is holding that particular Lock or Latch.



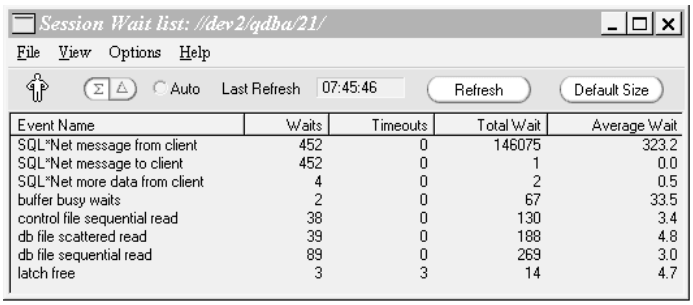
Session Detail Toolbar

The bottom toolbar on the Session Detail Screen has three groups of lists located on either side of the navigation buttons. These groups are the Session group, the Activity group and the Objects group. The lists are the same as the lists on the Instance Overview screen but are specific to the session.

Filters in the Instance Overview lists are automatically applied in the Session Detail version of the lists.

The Session Wait List and the Lock List are filtered on Session ID.

The Session Wait List shows all database wait events and average wait times for the session, and can be used to profile what subsystems may be contributing to poor user response time.



Event Name	Waits	Timeouts	Total Wait	Average Wait
SQL*Net message from client	452	0	146075	323.2
SQL*Net message to client	452	0	1	0.0
SQL*Net more data from client	4	0	2	0.5
buffer busy waits	2	0	67	33.5
control file sequential read	38	0	130	3.4
db file scattered read	39	0	188	4.8
db file sequential read	89	0	269	3.0
latch free	3	3	14	4.7

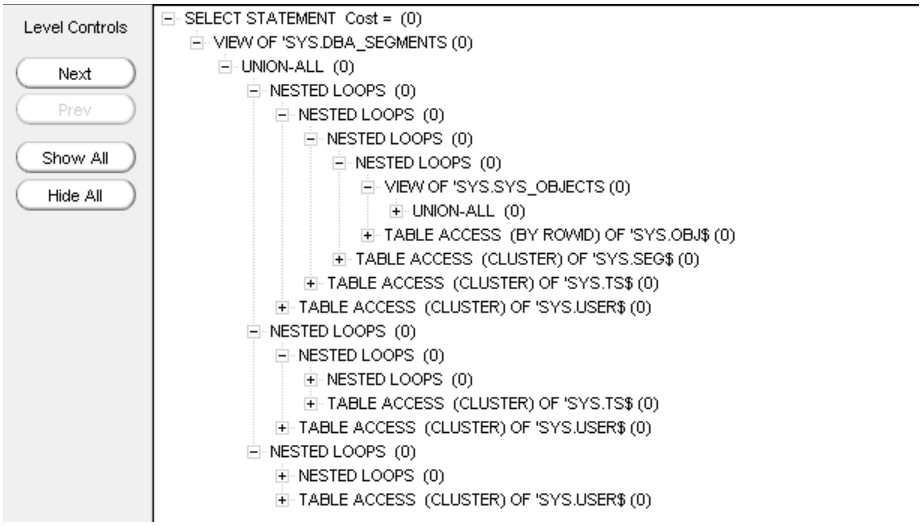
The Lock List displays all the locks held by the session and all objects accessed by the session.

The Synonym List and Segment list are both filtered by the Username corresponding to the session.

The Segment List shows all database segments owned by the user, including tablespace name, segment type and size of the segment.

The Synonym List shows all private synonyms owned by the user and is useful for finding the physical object referred to in SQL.

SQL WINDOW The SQL Window is used to analyze and/or execute SQL statements. It is useful for improving SQL performance by providing a simple, interactive EXPLAIN utility for displaying the ORACLE7 optimizer's query plan analysis.

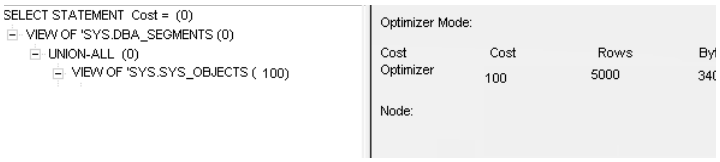


Explain Plan — Executes EXPLAIN PLAN on the SQL statement in the edit window and displays formatted output in the output window.

Execute SQL — Executes the current SQL in the edit window and displays the output in a Q list control in the output window.

Format SQL — Formats the SQL in the edit window, making it easier to read and/or identify key clauses and components, e.g. which tables are in the FROM clause of a SELECT statement.

EXPLAIN AND COST BASED OPTIMIZER



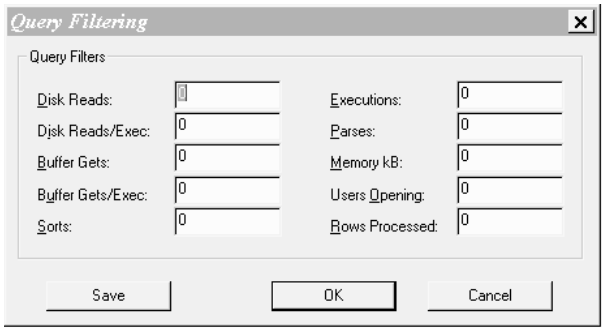
Extended Query Plan

The cost information depends on cost base optimizer and parallel query which is only available in ORACLE 7.3

The explain window is divided into two windows. The left window displays ORACLE's execution plan. The right window displays detailed information for each line of the plan. As you choose or highlight a line in the plan, detailed cost information is displayed in the right hand window. Analyze must be run to see the most detailed information.

SQL AREA VIEWER

The SQL Area Viewer facilitates probing the ORACLE7 instance for SQL which may be consuming excessive resources and therefore negatively impacting database performance overall. SQL of interest can be further examined using the built-in SQL Window. Upon accessing this screen you are presented with the Query Filtering box. After selecting your filter criteria, you may save this information for future queries or click OK to view your selection.



Query Filters

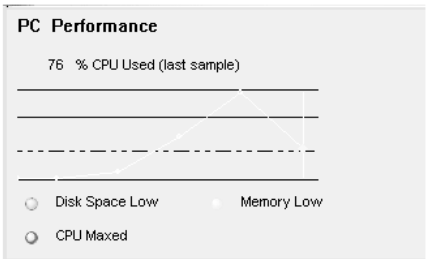
The query filters button is used to identify the most resource-intensive SQL by limiting the query on the SQL Area to only statements which exceed the filter criteria.

Cursor Users

The Cursor Users button displays a list of all user sessions holding an open cursor on the highlighted SQL, and can thus be used to identify users responsible for excessive resource consumption.

PC VIEWER

The PC Viewer screen provides all information necessary about a user's PC (Diagnostic Engine for the Client must be installed). This screen lets you see both hardware and software details. Along with the utility buttons on the bottom toolbar of this screen are three groups of pop-up lists. They are the Client group, the Activity group and the Database group. These lists will be discussed at the end of this chapter.



PC Performance

The PC Performance area tells you what percentage of the CPU is being used and charts the performance. The CPU utilization is charted on a graph which displays two solid lines and one dotted line. The dotted line displays the average CPU utilization for the system and the solid lines above and below display the normal variance. Holding your mouse below the graph line will pop the screen displaying the average usage and the Normal Range. To get detailed data point times and values simply double click your mouse below the graph line. Up to 60 data points can be collected which means you will be viewing data points from the previous hour. If there is a reboot of the PC, the data point collection begins from that point.

Data Points

To get detailed data point times and values simply double click your mouse below the graph line.

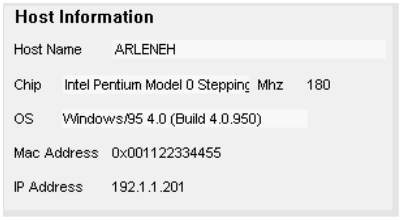
Directly below the Performance Graph are three visual indicators which display the status of CPU utilization, Disk Space availability and Memory utilization. In their normal state, these buttons are blue. They transition from yellow to red as resources reach capacity.

Session Activity

The Session Activity area provides you with detailed information about the PC session, including reboot history and the user id used to attached to the network and the length of time the PC has been active.

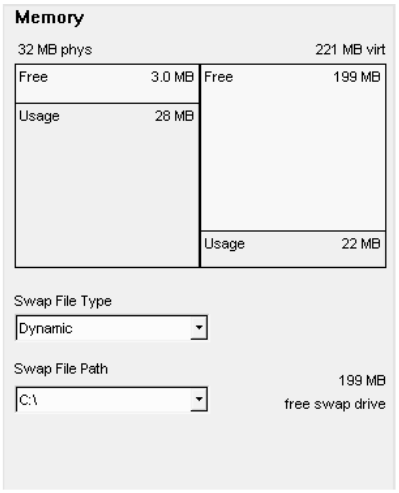
Host Information

The Host Information area of the screen provides the following data about the PC being viewed: Host Name, Type of chip in the PC, Chip speed and the type of operating system, MAC Address and the IP Address.



Memory

The Memory area of the screen provides information on the physical and virtual memory of the PC being viewed. Free or available space is shown in a lighter color. If the right hand portion of the memory control, which represents virtual memory, is more than 20% utilized - this PC could benefit from additional physical memory.

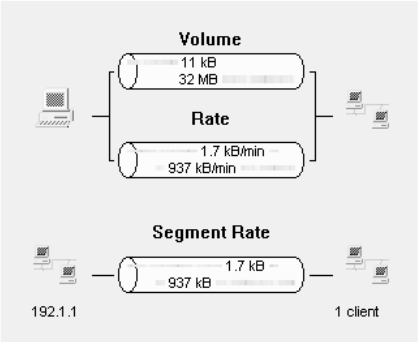


Machine Network Status

The Machine Network Status area of the screen is designed to show Network ID information and how much network activity the client PC is involved in.

Network ID information provided includes: adapter type, driver and the driver version. TCP/IP information provided includes: vendor, version, IP Address, and the Subnet. You will also be able to see if the WINS server or the DNS server is enabled for the PC.

Network Activity information is displayed through the Network Tube controls. These controls provide information on the total network traffic to and from the PC since connection, the speed of the traffic (in bytes per minute) and the traffic rate for the latest segment. Holding the mouse over this control will display the actual totals sent and received.



PC VIEWER POP-UP LIST

The PC Viewer bottom toolbar currently has three groups of pop-up lists.

Client Group

Environment Variables 

List of all variable names and values for the PC. [Displays information which would be displayed by typing SET at a DOS prompt]

System Path 

Detail entries in the system path. Displays entries in search order. [Displays information which would be displayed by typing PATH at a DOS prompt]

Activity Group

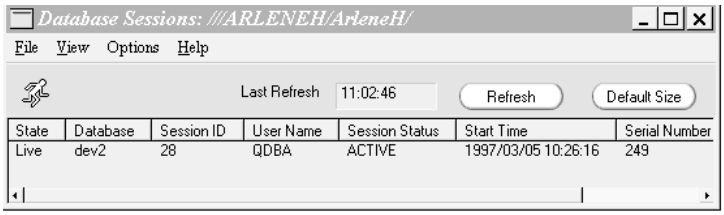
Active Processes 

List of all active programs running on the PC with drill down to the module level. Version information is displayed if provided by the software vendor.

Database Group

Database Sessions 

List of all database sessions currently active in the database which were initiated by this PC. This list can identify dead sessions which were created by a user rebooting their PC. The reboot time [from the reboot history log] is compared to the ORACLE session start time. If ORACLE session start time was prior to the most recent reboot entry, the session is shown as a dead session.



Appendix A Technical Information

IS THE DIAGNOSTIC ENGINE FOR ORACLE RUNNING?

The Instance Overview screen of the Q Viewer contains a status button for the Diagnostic Engine for ORACLE. This button is a light blue when the Diagnostic Engine is running and red when it is not. Double clicking on the button provides execution detail about the engine process. To manually check if the Diagnostic Engine is running:

```
connect as QDBA
SQL>    var status VARCHAR2(12)
SQL>    execute :status := q$bgproc.driver_exec_stat;
SQL>    print status
```

START & STOP THE COLLECTION ENGINE MANUALLY.

The Diagnostic Engine for ORACLE restarts itself automatically, each time the Instance is restarted. To start or stop the engine manually, complete the following steps.

Manual Start

```
        connect as QDBA
SQL>    execute q$bgproc.start_driver;
```

Manual Stop

```
        connect as QDBA
SQL>    execute q$bgproc.stop_driver;
```

NOTE: It is possible for ORACLE internal contention to cause the stop_driver procedure to "hang". If this occurs, start another SQL*Plus session and issue the stop_driver procedure call again.

INSTALLING DIAGNOSTIC ENGINE FOR ORACLE MANUALLY

The QSETUP.SQL script is normally run from the Q installer, however it can be executed manually from SQL*Plus as follows:

Connect as SYS. Note: 32 bit SQL*PLUS is required.
SQL> start Qsetup.sql

QSETUP Syntax
start <install_dir>\qsql\qsetup.sql <install_dir> <connect_string> <Q table space> <temp_tablespace>

Where:	<connect_string>	=	service name (database connect string) to the target database.
	<Q tablespace	=	tablespace to hold for Q system objects.
	<temp_tablespace>	=	temporary tablespace for the QDBA user.

Example: start C:\Savant\qsql\qsetup.sql C:\Savant dev1 QDATA TEMP

Script output is logged to <install_dir>\qsql\qsetup.log. Check this file for errors.

DE-INSTALL DIAGNOSTIC ENGINE FROM ORACLE INSTANCE

To drop the Q diagnostic Engine from the database:
Connect as SYS
SQL> start <install_dir>\qsql\QDROP.sql

This script drops all Q objects including the QDBA user. Please note - dropping the QDBA account takes approximately 20 minutes. Dropping installed packages can be time consuming.

IS THE DIAGNOSTIC ENGINE FOR THE CLIENT RUNNING?

The Diagnostic Engine for the Client restarts itself automatically, each time the Workstation is rebooted. To start or stop the engine manually, complete the following steps.

Starting the Diagnostic Engine for the Clients Manually

To start Diagnostic Engine for Client manually, select the "Diagnostic Engine for Client" menu option under the installed "Q" menu.

Double-click

Diagnostic Engine for Client is initiated

Diagnostic Engine for Client will only return a message if it cannot be started

Stopping the Diagnostic Engine for the Client Manually

To stop Diagnostic Engine for Client manually, select the "Diagnostic Engine for Client" menu option under the installed "Q" menu.

The system returns a message that Diagnostic Engine for Client is already running, and asks if you want to shut it down.

Reply "Y" (Yes) and the Diagnostic Engine for Client is terminated.

Appendix B Troubleshooting Q

ORACLE RELATED INSTALLATION PROBLEMS

SQL*PLUS unable to connect to the database

1. Verify that the Instance is up and available at the host or another client.

2. Verify that the SQL*NET listener is active on the host.

3. Check SQL*NET Configuration on the workstation
   - Execute Oracle's SQL*NET Easy Configuration
   - Choose add or modify database alias
   - Check that the connect string specified is correct
     that the alias name is correct

Sample TNSNAMES.ORA

```
Example2.world      =
(DESCRIPTION        =
 (ADDRESS_LIST      =
   (ADDRESS         =
    (COMMUNITY      =       TCP.world)
    (PROTOCOL       =       TCPIP)
   (Service         =       Server_lsnr)  )
(CONNECT_DATA   =           (SID = ORCL)   )  )
```

4. Verify that the Windows registry entry for TNS_NAMES path is correct
   From the Windows Start button
   RUN regedit
   Expand HKEY_LOCAL_MACHINE
   SOFTWARE
   ORACLE
   Verify TNS_ADMIN points to the location of the tnsnames.ora file

Most of the ORACLE supplied packages (named with prefix "DBMS_") are created by the catproc.sql script which is executed during initial database creation. The ORACLE supplied packages are located in the <ORACLE_HOME>/rdbms/admin directory.

If QSETUP.LOG indicates that some required packages exist but are INVALID, then the catproc.sql script may not have properly executed. Refer to ORACLE documentation for corrective action.

If the package DBMS_SHARED_POOL is missing, this can be created by connecting to the database as SYS and executing the following scripts in order:

<ORACLE_HOME>/rdbms/admin/dbmspool.sql
<ORACLE_HOME>/rdbms/admin/prvtpool.plb

Q RELATED INSTALLATION PROBLEMS

Symptom:

Q Package compiles with errors.

Problem:

The installation process was unable to grant a privilege to the QDBA user.

Solution:

The QSETUP.LOG file will show one or more ERRORS. If the errors are grant related, the problem can be corrected as follows:

```
        Connect as SYS
SQL>    start <install_dir>\qsql\qsysvws.sql
```

Scan the QSETUP.LOG file and note the name of each package which failed. Manually recompile the package(s) which received errors.

```
        Connect as QDBA
SQL>    ALTER PACKAGE [pkgname] COMPILE BODY;
```

Example:ALTER PACKAGE qdba. Q$bgproc COMPILE BODY;

OR if the errors are not grant related call Savant Corporation Technical Support @ 800.489.5311 for assistance.

Symptom:

User receives an ORA-4031 Error during Q package compilation.

Problem:

Insufficient ORACLE Shared Pool memory is available to perform the package compilation.

Solution:

1. Flush the shared pool using the "ALTER SYSTEM FLUSH SHARED_POOL" command and recompile the packages from source as described below.

2. If package compilation still fails due to insufficient memory after flushing the Shared Pool, increase the size of the Shared Pool by increasing the SHARED_POOL_SIZE initialization (init.ora) parameter. Database needs to be shut down & restarted for parameter initialization to take effect. Recompile packages as described below.

Recompiling the Q Packages

To recompile all Q packages from source code:

Connect as QDBA

SQL> START <install_dir>\qsql\RECOMPIL.SQL

NOTE: All Q Viewers should disconnect from the database before executing this script. Failure to do so can cause problems with the Q user interface, or cause the recompilation process to fail.

Symptom:

Cannot GRANT EXECUTE on DBMS_PIPE or DBMS_LOCK after installing Q.

Problem:

The Q Diagnostic Engine for ORACLE uses many of the ORACLE supplied packages, including DBMS_LOCK and DBMS_PIPE. While the Engine is running, any attempt to GRANT EXECUTE on these packages to a user will hang on a "library cache pin".

Solution:

1. Shut down the Q Diagnostic Engine for ORACLE (see Appendix A - Technical Information).
2. Perform the GRANT statements.
3. Restart the Q Diagnostic Engine for ORACLE (see Appendix A - Technical Information).

Symptom:

During Q installation, user gets Error message:

"WARNING: Setup did not detect a valid ORACLE installation on your system".

Problem:

It is likely that the user has upgraded the PC from Win 3.1 to Windows 95 or Windows NT with out upgrading the ORACLE software (SQL*Plus and SQL*Net). This means user is still running 16-bit versions of ORACLE software on the client and Q cannot install the Diagnostic Engine for ORACLE using 16-bit SQL*Plus.

Solution:

Upgrade to 32-bit SQL*Plus and SQL*Net.

Symptom:

Q Controls display solid white fill, rather than a granular white (Activity Controls) or yellow (Queue Controls) fill. (Review CD insert - Q Diagnostic Center Controls - for correct colors)

Problem:

Display color palette for the monitor is at a setting less than 256 colors.

Solution:

Set the color palette to 256 colors. If you can not support this setting you should upgrade your hardware.

Symptom:

When attempting to install the PC Client engine to ORACLE clients, the following message is returned:

"WARNING: Setup could not find a version of SQLPlus.exe, Plus33.exe, or Plus32.exe in your '%\bin directory. Either ORACLE is not configured correctly or you are running a version of ORACLE that is not supported by Q. Q supports v7.2 or later".

Problem:

SQL*Plus is a 16-bit version rather than 32-bit.

Solution:

Upgrade to 32-bit version of SQL*Plus and SQL*Net on client machine.

Savant Corporation License Terms

Please read these terms carefully, by choosing <Accept> during product installation, you ("Customer") are agreeing to the following terms.

There are four sections to the license terms. The first section is specific to the Trial License Agreement. The second section is specific to the Full License Agreement. The third section is specific to the Consulting License Agreement. The fourth section is common to all Licenses, unless otherwise specified under prior sections.

1. TRIAL LICENSE: Savant Corporation ("Savant") grants Customer a no-charge trial license to use the software ("Software") solely for evaluation purposes for a period of 30 days. Customer may evaluate and use the Software solely for its own internal data processing operations. Customer must purchase a full-use license to use the Software after the end of the 30-day trial period.

2. FULL LICENSE:
Savant Corporation ("Savant") grants Customer a license to use the software ("Software") solely for the internal data processing operations of the Customer.

3. CONSULTING LICENSE:
Savant Corporation ("Savant") grants Customer license to install the selected ("Software") on a single ORACLE database to support consulting activities for a period of 45 days per consulting contract. After 45 days, the Software must be de-installed or a Full Use License must be purchased.

4. GENERAL TERMS:

Customer may:

a. Install the Diagnostic Engine for ORACLE on individual ORACLE databases, up to the license limit purchased.
b. Install the Q Viewer without limit.
c. Install the Q Diagnostic Engine for the Client without limit.

COPYRIGHT: The Software, associated media, any printed materials and any "online" or electronic documentation is the proprietary product of Savant and is protected by copyright law. You acquire only the right to use the Software and do not acquire rights of ownership. You agree not to cause or permit the reverse engineering, disassembling, or decompilation of the Software.

WARRANTY DISCLAIMER: Savant is providing this license on an "as is" basis without warranty of any kind; Savant disclaims all express and implied warranties, including the implied warranties of merchantability or fitness for a particular purpose.

TRADEMARKS: Savant, Q, the Q logo and Diagnostic Center are trademarks of Savant Corporation. Oracle is a registered trademark of Oracle Corporation. Adobe and Acrobat are trademarks of Adobe Systems Incorporated.

LIMITATION OF LIABILITY: SAVANT SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING DIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, REVENUE, DATA, OR DATA USE, INCURRED BY YOU OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT OR TORT, EVEN IF YOU OR ANY OTHER PERSON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.