High Load Capture for Oracle

User's Guide

Version 2.10

DBA INFOPOWER

Contents

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Introduction

This chapter describes how to use this guide. It also explains how to contact DBA InfoPower and get technical support.

Special conventions used in this guide

This guide uses the following typographic conventions:

Example	Description
The **Chart** button	Bold is utilized for the literal names of interface objects used to perform actions (for example, toolbar button names, menu names, icon names, dialog box options, and dialog box titles).
View -> Swap Panels	The arrow symbol indicates menu path. In this example, choose View, and then choose Swap Panels from the View menu
Variable	italic type indicates a placeholder for information that needs to be provided

Example	Description
Press ENTER	Names of keyboard keys appear in capital letters.
Press ALT + F1	A plus sign (+) between key names indicates that keys are to be pressed in combination. For example, ALT+F1 means to hold down the ALT key while pressing the F1 key.
Press the DOWN	Direction keys are referred to by the direction of the arrow
ARROW key	LEFT, RIGHT, UP or DOWN keys

Guide in PDF format

This guide is provided in Adobe Acrobat portable document format. The PDF file is included in High Load Capture installation package. To view the PDF file, you need Adobe Acrobat Reader version 6.0 or higher. Adobe Acrobat reader is available on the Adobe Web site at: http://www.adobe.com/

Additional information

DBA InfoPower product information
You can contact DBA InfoPower for product information in any of the following ways:

Web page: http://www.dbainfopower.com

E-mail (sales & marketing) sales@dbainfopower.com

Contacting customer support

DBA InfoPower support team is dedicated to ensuring successful product installation and use for all DBA InfoPower solutions.

Support Link: http://www.dbainfopower.com/dbaip_support.php

E-mail: support@dbainfopower.com

High Load Capture support

Should you encounter any problems with Performance Explorer, follow these steps:

1. Copy contents of the High Load Capture execution console to a diagnostics text file

2. Capture picture of an error to an image file

3. Copy contents of the High Load Capture error dialog to the diagnostics text file

4. E-mail these files to support@dbainfopower.com with your request for assistance

DBA InfoPower, Inc. enables business continuity

In today's economy, businesses rely on information contained in their databases to take orders, process requests and provide information to their employees, customers and partners. Accordingly, it is vital for businesses to ensure uninterrupted reliable operation of their databases.

Databases have, however, become increasingly complex and hard to manage. There is an unprecedented amount of data stored by today's enterprises, creating an increasing strain on their databases. Databases are also being accessed more frequently for a growing number of purposes.

The combination of database importance and complexity of managing database infrastructure has created a demand for products that can improve database performance and availability. Even brief database failures can now cost millions of dollars to companies.

To help businesses mitigate these problems and provide reliable uninterrupted service, DBA InfoPower developed a line of products that improve database performance, availability and manageability.

With DBAip's solution, enterprises can improve database performance, avoid costly downtime and other service interruptions, and make IT personnel more efficient in preventing problems and managing daily database operation.

DBAip's solutions should deliver immediate return on investment for their enterprise customers as they allow more efficient and effective use of customers' critical database resources.

Welcome to High Load Capture for Oracle

High Load Capture™ is a complete real time root cause analysis product that enables rapid discovery of database overload conditions, such as response time spikes, replacing complex and time-consuming manual performance analysis and report generating products.

Unique analytical capabilities and interface of High Load Capture provides you with a clear visualization and analysis of activity on your database. Visual Analysis System vividly identifies and displays spikes and correlations between different key statistics and metrics.

This chapter explains the main features of High Load Capture for Oracle.

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Overview of High Load Capture for Oracle

Main Panel

Main Panel enables the users to instantly visualize and correlate changes in captured database and system performance in order to identify root cause of performance problem or degradation

Connection Manager Panel

Connection manager panel allows the user to configure connections to the database server and Unix/Linux serves that is used to capture performance data
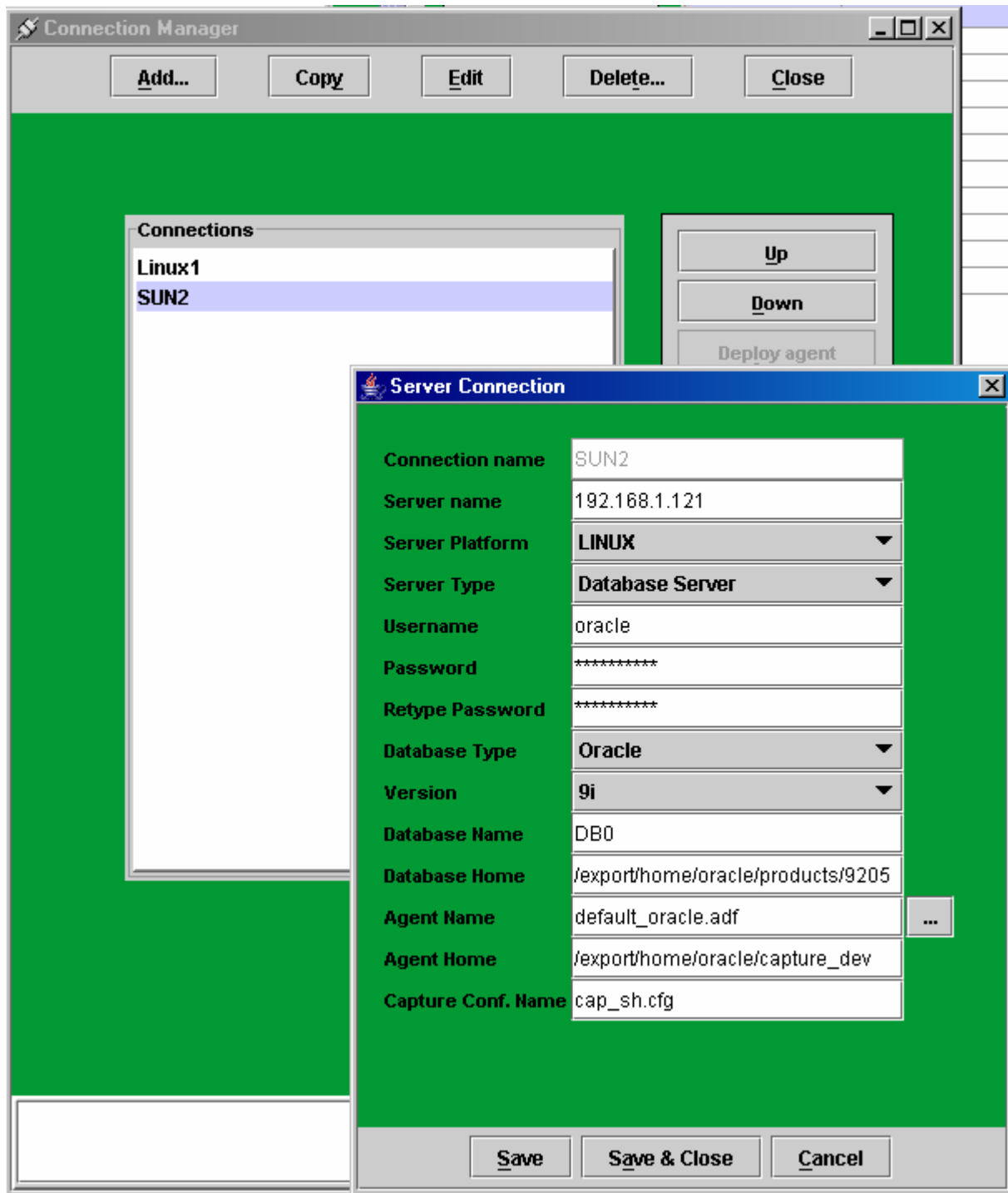
Metric Threshold Panel

Metric threshold panel allows the users to dynamically set horizontal thresholds in order to clearly distinguish values, crossing the threshold.

Capture Measurement	Threshold
2095543314/EXECUTIONS	
2095543314/BUFFER_GETS	
2095543314/DISK_READS	
2095543314/PARSE_CALLS	
2095543314/SORTS	
2098480553/EXECUTIONS	
2098480553/BUFFER_GETS	
2098480553/DISK_READS	
2098480553/PARSE_CALLS	
2098480553/SORTS	
2201872251/EXECUTIONS	
2201872251/BUFFER_GETS	
2201872251/DISK_READS	
2201872251/PARSE_CALLS	
2201872251/SORTS	
2268927646/EXECUTIONS	100
2268927646/BUFFER_GETS	
2268927646/DISK_READS	
2268927646/PARSE_CALLS	
2268927646/SORTS	
2618850598/EXECUTIONS	
2618850598/BUFFER_GETS	
2618850598/DISK_READS	
2618850598/PARSE_CALLS	
2618850598/SORTS	
3587907089/EXECUTIONS	
3587907089/BUFFER_GETS	
3587907089/DISK_READS	
3587907089/PARSE_CALLS	
3587907089/SORTS	

Data Capture:Set Measurement Threshold

Double Click to Begin Threshold Editing

Apply   Done   Cancel

Features of High Load Capture

High Load Capture is designed with ease of installation and simplicity of use and maintenance in mind. A combination of powerful analytical capabilities and simplicity of operation makes the High Load Capture a tool of choice for complex production and development database environments.

Features of High Load Capture include:

♦ Easy installation and maintenance

♦ Easy to use manuals

♦ Extremely fast collection on vast arrays performance data with no noticeable impact on production system performance.

♦ Extremely fast analysis of vast arrays of collected data with no noticeable impact on system performance.

♦ No data objects or stored procedures are created in the database.

♦ Real Time Root cause analysis of changes in database performance

♦ Performance analysis engine

♦ Visual Root Cause Analysis of database performance

♦ Discovery of changes across multiple timelines

♦ visual root cause analysis across multiple databases (on a second by second granularity)

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Getting started with
High Load Capture for Oracle

This chapter covers everything you need to know to start using High Load Capture for Oracle. It explains how to:

- Install High Load Capture
- Start High Load Capture
- Connect to a database

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Installation of High Load Capture for Oracle

This procedure outlines how to install High Load Capture Analysis Module on your workstation. Installation of High Load Capture is very straightforward and should only take a few minutes to complete. Close all other applications before loading the CD into your PC. You can cancel installation at any time by pressing the **ESC** key or by clicking the **Cancel** button.

To install High Load Capture for Oracle

Insert the High Load Capture CD in your CD-ROM drive or download High Load Capture installer from the URL provided by a representative of DBA InfoPower, Inc.

Depending on your system configuration, installation program may start automatically, or you may have to start it yourself. If installer starts automatically, follow instructions on the screen to complete installation.

If the installation program does not start automatically when CD is inserted, select **Run** from the Windows Start menu.

Type **d:\dbaip_hlc_201.exe** (where **d:** is the CD-ROM identifier and **201** is the version number), and click **OK**.

Follow the instructions displayed on the screen.

By default, High Load Capture for Oracle is installed in the following directory, though you can choose a different installation path.

    C:\Program Files\ DBAip High Load Capture

Multiple installations of High Load Capture for Oracle

Advanced High Load Capture installer allows you to install and separately upgrade multiple versions of High Load Capture for Oracle on your computer.

Authorizing High Load Capture for Oracle

If you are a new user of High Load Capture for Oracle, you will have a trial period in order to test the product. When the trial period expires, High Load Capture for Oracle will stop functioning.

To maintain full functionality, contact your DBA InfoPower, Inc. representative for information on obtaining a full licensed version. For further information see "Product authorization errors".

Uninstalling High Load Capture for Oracle

To uninstall High Load Capture for Oracle, use the **Add/Remove Programs** option in the Windows **Control Panel** in the **Start** menu.

Starting High Load Capture for Oracle

In order to connect to a database, you need to complete the following steps:

1. Launch the application

2. Connect to the desired database or multiple databases

High Load Capture for Oracle can be launched in one of two ways: directly, or from DBA HeartBeat Console. The simplest way to get started is to launch High Load Capture directly.

Launching High Load Capture Directly

High Load Capture can be launched directly from the Windows Start menu. Appropriate High Load Capture can be found on the Windows Start menu under:

> **DBAip High Load Capture > DBAip High Load Capture**

Launching From DBA HeartBeat Console

When DBA HeartBeat Console is available, you can also launch High Load Capture by selecting "Capture manager" option on the DBA HeartBeat Console.

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Using High Load Capture for Oracle

High Load Capture Data Capture Module

High Load Data Capture Module (HLC Data Capture Module) is a binary module available for Linux and UNIX platforms that enables the user to capture necessary database/system performance data metrics in order to be able to understand and eliminate root causes of the negative database/system performance and response time.

HLC Data Capture Module is using configuration file in order to define what data needs to be captured as well as many other capture parameters (see "HLC Data Capture Initialization and Configuration Parameters" chapter).

Data Collection Elements called **"data captures".** Below are the main Data Capture characteristics:

- Data Captures are configurable through configuration file

- **TRIGGERING** Data Captures can activate and control **REGULAR** data captures based on a threshold crossover and defined group of controllable **REGULAR** data captures

- Data Capture can be either active (capture data) immediately upon Data Capture Module startup, or be idle activated only by **TRIGGERING** Data Capture

- Data Captures can be either **"database"** or **"external"** type

- In order to minimize processing resources during the capture process, "database" Data Captures are pre-spawning database connections and parse SQL immediately on a startup

- Data Capture can send SNMP traps on alert (crossing defined thresholds) and record alerts into alert file

- Data Capture generates detailed text report for every collected data sample and saves it into capture log

- Data Capture archives capture logs using round-robin mechanism (similar to Oracle archiving)

Sample "Database" Data Capture configuration entry:
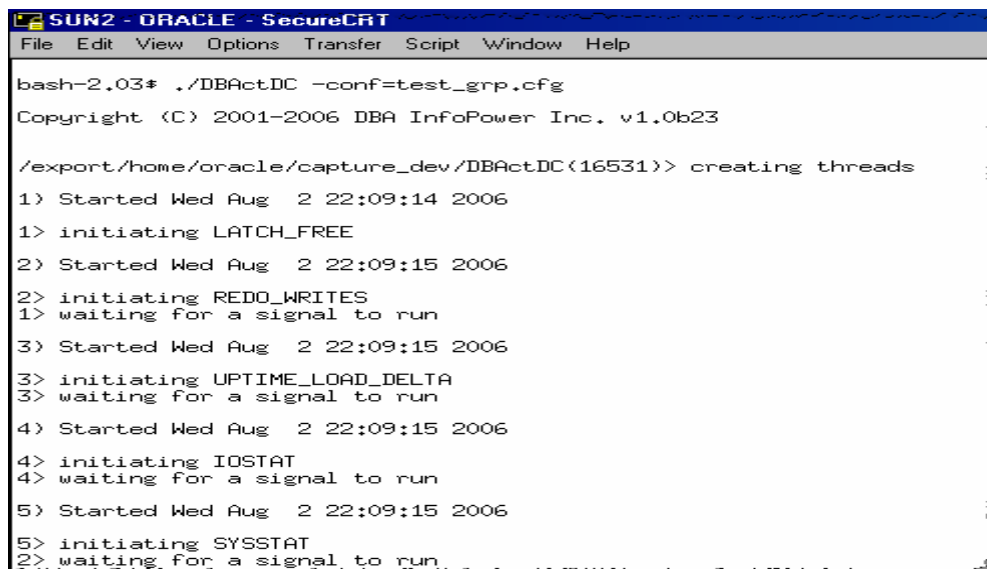
```
{
  'connection' => {
    'data_source' => {
      'params' => {
        'database' => '',
        'sql' => 'select hash_value, executions,
                  buffer_gets, disk_reads, parse_calls, sorts
                  from v$sql'
      },
      'name' => 'database'
    },
    ,'file' => '/export/home/oracle/capture_dev/sql_delta.log'
    ,'connection_type' => { 'name' => 'capture' }
    ,'cycle' => 5
    ,'alert_capture_cycle' => 1
    ,'active_flag' => 'y'
    ,'activate_on_startup'  => 'y'
    , 'filter_threshold_abs' => 10
    ,'delta_flag' => '1'
    #,'charting_concentrator_index' => 1
                        },
  'name' => 'SQL_DELTA'
},
```

Sample "External" Data Capture configuration entry:

```
{
  'connection' => {
      'data_source' => {
        'params' => { 'name' => './mpstat.sh' }
        ,'name' => 'external'
      }
      ,'file' => '/export/home/oracle/capture_dev/mpstat.log'
      ,'connection_type' => { 'name' => 'capture' }
      ,'cycle' => 2
      ,'alert_capture_cycle' => 2
      ,'activate_on_startup'  => 'y'
      ,'active_flag' => 'y'
      ,'delta_flag' => '-1'
      ,'charting_concentrator_index' => 1
                        },
  'name' => 'MPSTAT'
},
```

Note: See HLC Data Capture Initialization and Configuration Parameters" chapter for detail parameter information

Detailed text report entry generated by Data Capture generates contains:

- Capture timestamp in MM/DD/YYYY HH24:MI:SS.SSS and UNIX time formats
- Capture Data Header
- Captured Data (Absolute or Delta values)
- Measurements that changed from zero (0) to non-zero
- Measurements that crossed defined threshold (absolute and/or percent)
- Measurements that did not exist in previous sample (new measurements)

Report Sample:

- **Time: 07/28/2006 18:56:17.494,1154138177**
- **Header: NAME,VALUE**
- **SQL*Net message from client:1**
- **SQL*Net message to client:1**
- **control file parallel write:1**
- **control file sequential read:4**
- **pmon timer:2**
- **rdbms ipc message:6**
- **>>>>>>>>>>>>>>>>>>>>>>>>>>>> Values changed from zero to non-zero**
- **From 0: control file sequential read:4**
- **>>>>>>>>>>>>>>>>>>>>>>>>>>>> Threshold Crossed**
- **15% Threshold crosed: pmon timer:2 from 1**
- **15% Threshold crosed: rdbms ipc message:7 from 5**
- **>>>>>>>>>>>>>>>>>>>>>>>>>>>> New Entries**

HLC Data Capture Module should be run as a daemon process. At the same time it can be run manually by the user

```
SUN2 - ORACLE - SecureCRT
File  Edit  View  Options  Transfer  Script  Window  Help

bash-2.03$ ./DBActDC -conf=test_grp.cfg

Copyright (C) 2001-2006 DBA InfoPower Inc. v1.0b23

/export/home/oracle/capture_dev/DBActDC(16531)> creating threads

1) Started Wed Aug  2 22:09:14 2006

1> initiating LATCH_FREE

2) Started Wed Aug  2 22:09:15 2006

2> initiating REDO_WRITES
1> waiting for a signal to run

3) Started Wed Aug  2 22:09:15 2006

3> initiating UPTIME_LOAD_DELTA
3> waiting for a signal to run

4) Started Wed Aug  2 22:09:15 2006

4> initiating IOSTAT
4> waiting for a signal to run

5) Started Wed Aug  2 22:09:15 2006

5> initiating SYSSTAT
2> waiting for a signal to run
```

Below are the main characteristics of the HLC Data Capture Module:

- Data Collection Module does not install any objects into database

- Multiple data "captures" (data collectors) can run on the same target

- Multiple data "captures" run in parallel

- Database "captures" connections are pre-spawned and "capture" SQL is pre-parsed

- Data Collection Agent uses configuration file to control settings of the "captures"

- Data Collection Agent configuration file settings can be changed dynamically

High Load Capture Analysis Panel
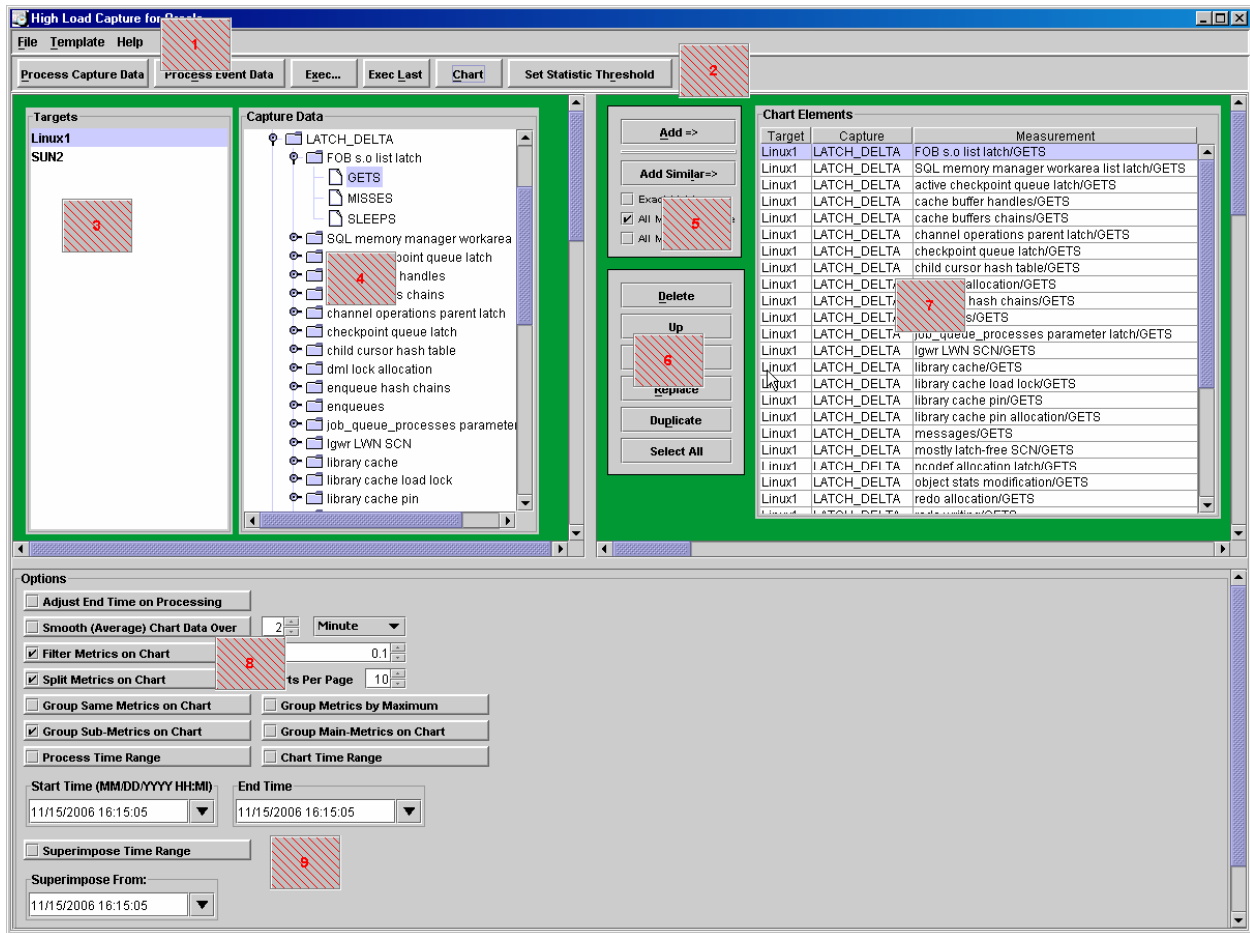
Analysis Panel

The following are the main elements of the Analysis Panel:

1) **User Menu**

User Menu allows user to:

    a) Call "Target Manager" module to create and edit existing data capture targets

    b) Open local capture files for processing
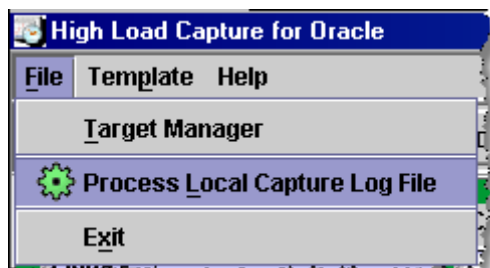
    c) Save and Use templates
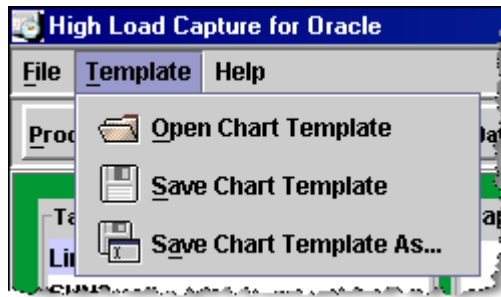
d) Retrieve Help Information

2) Action toolbar

Toolbar allows users to execute master functions of High Load Capture, such as:

1. **Process Capture Data** – retrieves and processes captured data from the target

2. **Process Event Data** – retrieves and presents event data across selected targets

3. **Exec**… - execute custom user script (opens script selection dialog)

4. **Exec Last –** re-execute script that was selected last time

5. **Chart –** create chart based on selected chart elements and chart options

6. **Set Statistic Threshold –** set horizontal threshold value for performance metrics – used on charts

3) Target List

Target list contains list data capture targets that are available for analysis of the captured data
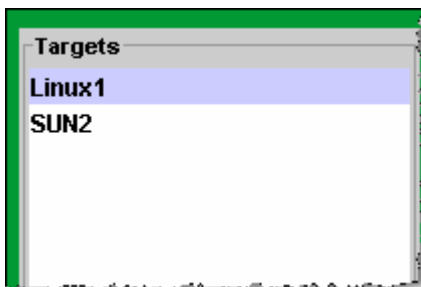
4) Captures List

Data Captures list contains captures and capture element that enable the user to select proper captured performance information for analysis
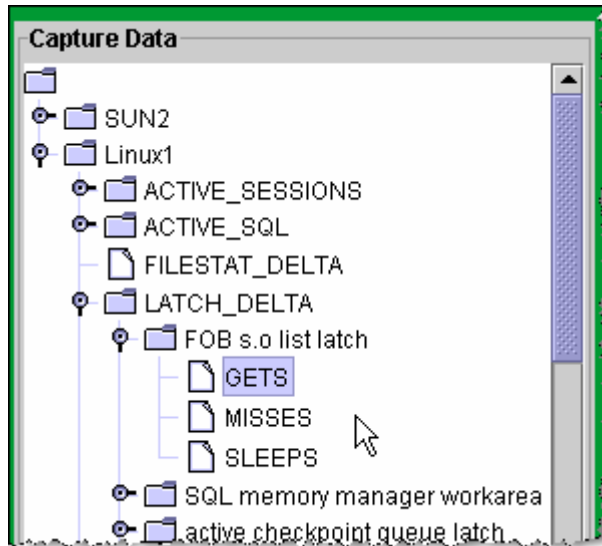
5) "Add chart item" control block
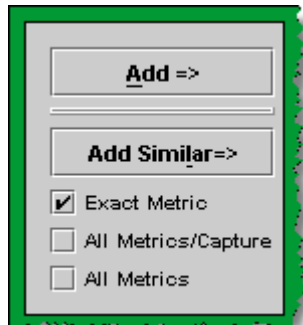
"Add chart item" control block enables user to optimize adding capture data elements to the chart item table by providing below single and group/mass selection options

1. **Add** – add exact selected captured metrics to the chart element table

2. **Add Similar** – add group of selected captured metrics to the chart element table

    a. **Exact metric** – add exact metrics across all captures (for example, add "physical reads" metric across all captures)
    b. **All Metrics/Capture** – add similar metrics within a selected capture (for example, add all "GETS" metrics across all latches within a selected capture)

c. **All Metrics** - add similar metrics across all captures (for example, add all "GETS" metrics across all latches across all captures)
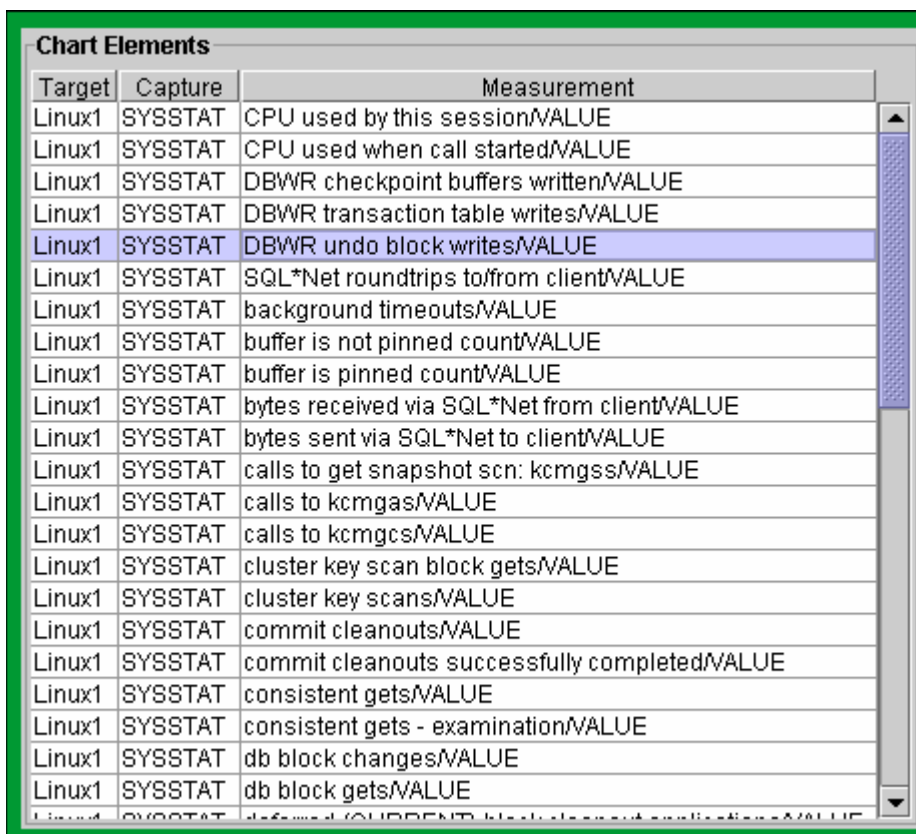
6) Chart Element control block

Chart Element control block enables user to manage selected chart items. Supported items are:

a) **Delete** - Delete chart item
b) **Up** - Move chart item up
c) **Down** - Move chart item down
d) **Replace** – change chart item target
e) **Duplicate** – Change target and duplicate chart item

7) Chart Element Item table

Target	Capture	Measurement
Linux1	SYSSTAT	CPU used by this session/VALUE
Linux1	SYSSTAT	CPU used when call started/VALUE
Linux1	SYSSTAT	DBWR checkpoint buffers written/VALUE
Linux1	SYSSTAT	DBWR transaction table writes/VALUE
Linux1	SYSSTAT	DBWR undo block writes/VALUE
Linux1	SYSSTAT	SQL*Net roundtrips to/from client/VALUE
Linux1	SYSSTAT	background timeouts/VALUE
Linux1	SYSSTAT	buffer is not pinned count/VALUE
Linux1	SYSSTAT	buffer is pinned count/VALUE
Linux1	SYSSTAT	bytes received via SQL*Net from client/VALUE
Linux1	SYSSTAT	bytes sent via SQL*Net to client/VALUE
Linux1	SYSSTAT	calls to get snapshot scn: kcmgss/VALUE
Linux1	SYSSTAT	calls to kcmgas/VALUE
Linux1	SYSSTAT	calls to kcmgcs/VALUE
Linux1	SYSSTAT	cluster key scan block gets/VALUE
Linux1	SYSSTAT	cluster key scans/VALUE
Linux1	SYSSTAT	commit cleanouts/VALUE
Linux1	SYSSTAT	commit cleanouts successfully completed/VALUE
Linux1	SYSSTAT	consistent gets/VALUE
Linux1	SYSSTAT	consistent gets - examination/VALUE
Linux1	SYSSTAT	db block changes/VALUE
Linux1	SYSSTAT	db block gets/VALUE

Chart Element Item table contains chart items that are selected by the user for visual analysis

8,9) Processing and Visual Analysis control panel

Processing and Visual Analysis control panel enables the user to granularly control setting required for capture data processing and visual analysis

Control elements are:

a. **Adjust End Time on processing** – when selected, every time capture data is processed, "End Time" field is adjusted to represent current time

b. **Smooth(Average) Chart Data Over** – when selected, visual data is averaged using smoothing time period

c. **Filter Metrics on Chart** – when selected, chart elements are excluded from visual analysis if maximum value of the chart element time series is less than filter value

d. **Split Metrics on Chart** – when selected, creates separate chart groups for the group of metrics. The ways groups are defined are dependant on different "Group" settings

e. **Charts Per Page** – define number of chart groups display on a single analysis page

f. **Group Same Metrics on Chart** – group exactly same metrics on chart, for example display "library cache" latch Misses across multiple targets within a same chart group

g. **Group Metrics by Maximum** – group metric by top value of the metric values series within a defined processing period.

h. **Group Sub-Metrics on Chart** – group sub-metric (see illustration below), for example chart all "BUFFER_GETS" for all SQL statements within a same chart group.

i. **Group Main-metrics on Chart** – group main metric (see illustration below), for example group "CPU used by this session" across all targets within the same chart group

j. **Process Time Range** – when selected capture data processing would obtain capture data related to the defined time range between start and end dates.

If "Process Time Range" option is not selected, capture data processing will obtain capture data between the last processing time and current time and would add this data to the existing data

k. **Chart Time Range** – when selected, time range between start time and time is used for visual analysis

l. **Start Time** – timestamp field used to set start time point for the capture data processing and visual analysis

m. **End Time** – timestamp field used to set end time point for the capture data processing and visual analysis

n. **Superimpose Time Range** – when selected "Superimpose From" field is used to set start data for the overlapping historical time period. Used by both capture data processing and visual analysis

o. **Superimpose From** - timestamp field used to set start time for the overlapping historical time period. Used by both capture data processing and visual analysis.

High Load Capture Target Manager

Target Manager enables the user to define the data capture targets.
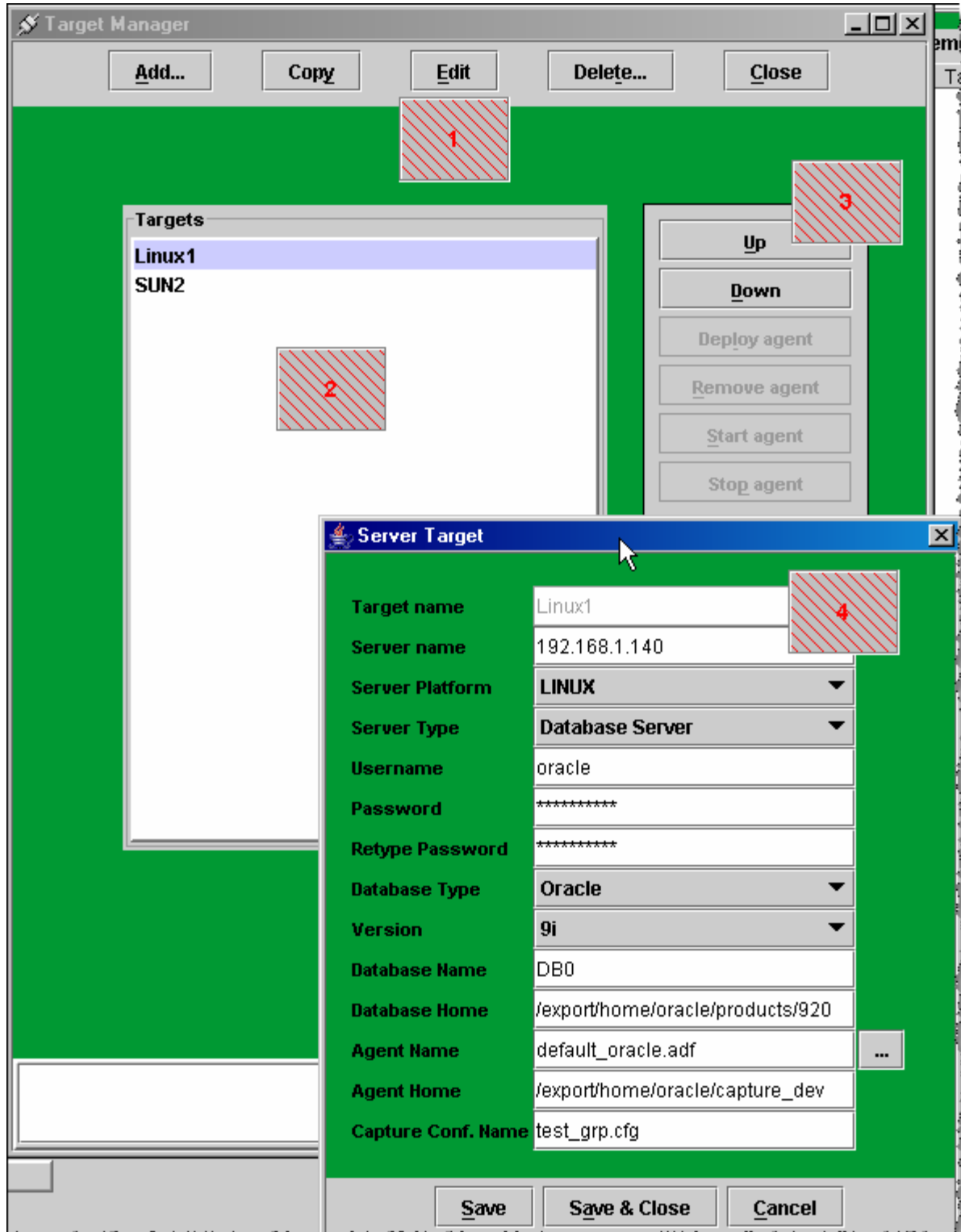
The following are the main elements of the Target Manager:

1. **Target management sub-panel** – allows users to Add/Copy/Edit/Delete targets

2. **List of existing targets**

3. **Target list management block** – allows the user to:

   a) **Up** – move target entry up
   b) **Down** – move target entry down
   c) **Deploy Agent** – deploy binary agent module and data capture definition to the target
   d) **Remove Agent** – remove agent installation from the target
   e) **Start Agent** – remotely start agent
   f) **Stop Agent** - remotely stop agent

4. **Target Edit Dialog**

Target edit dialog consists of below items:
   a) **Target name** – provided by used
   b) **Server Name** – server name or IP address
   c) **Server Platform** – Linux, Solaris Sparc, AIX, HP/UX
   d) **Server Type** – database or non-database server
   e) **Username** – OS user account name
   f) **Password** – OS user account password
   g) **Database type** – Oracle
   h) **Version** – database version – 9i/10g
   i) **Database name** – DB name
   j) **Database home** – database installation location (ORACLE_HOME for Oracle)
   k) **Agent Name** – name of the data capture agent
   l) **Agent home** – location when data capture agent is installed / would be installed
   m) **Capture conf. Name** – name of the data capture agent configuration file

High Load Capture Threshold Panel
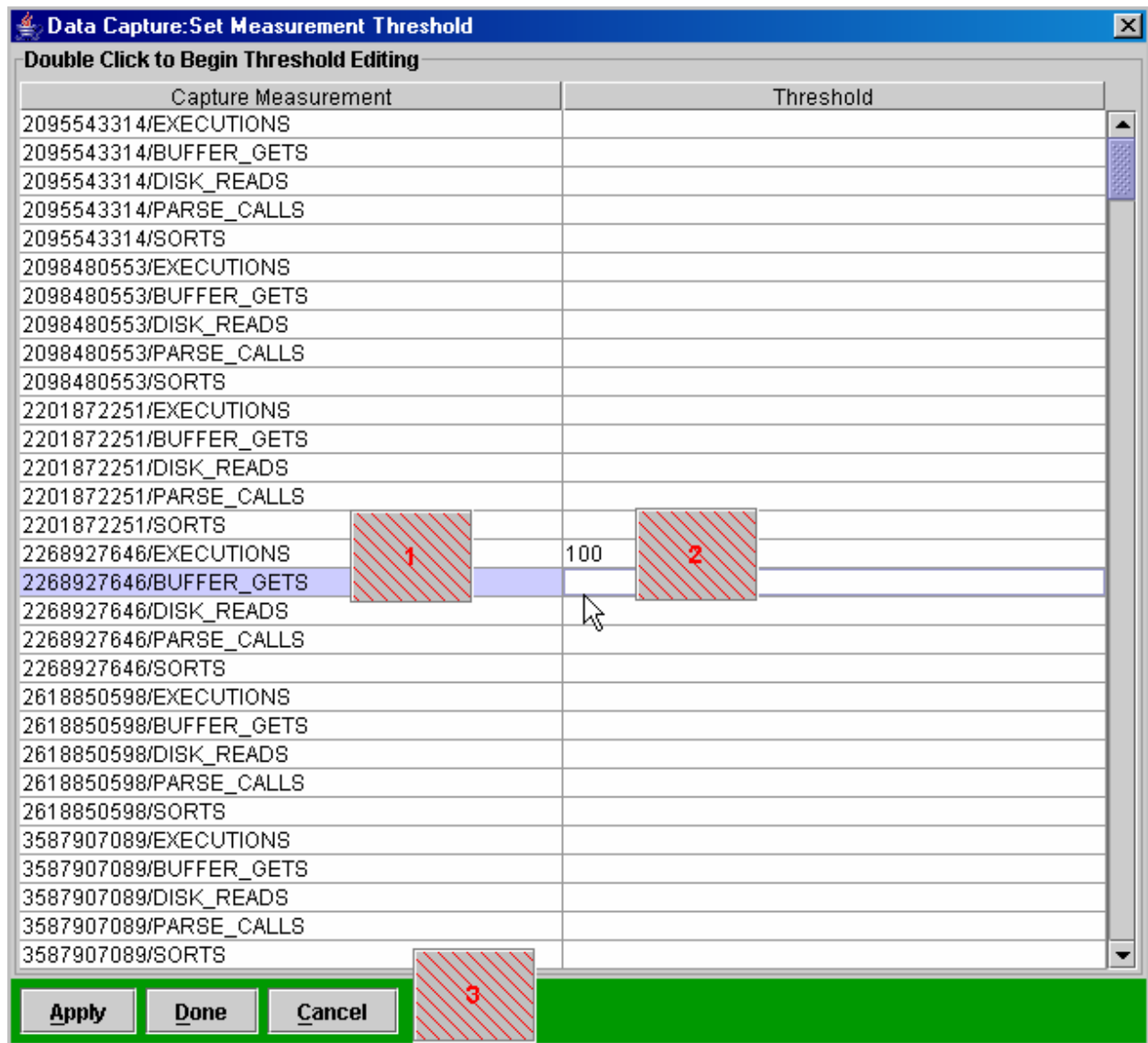
The following are the main elements of the Target Manager:

1. **Threshold Names** – generated based on existing chart item elements
2. **Threshold Values** – set by user to be displayed on a visual analysis charts
3. **Threshold Control Block** – Apply/Done/Cancel actions

Using High Load Capture to analyze and troubleshoot your database

Below are sample scenarios demonstrating how High Load Capture can be used to troubleshoot database performance issues and find out the root cause of performance degradation. These scenarios are provided as recommendations for using High Load Capture in production and development environments.

Database performance degradation

Case: At some point in time, database performance and response time become inadequate for business requirements

Recommendation:

During immediate problem investigation it is advisable to prepare data capture configuration that would capture a main set of performance metrics, such as database system statistics, system events, latches, executed SQL, segment I/O, I/O statistics (iostat), CPU related statistics (mpstat), paging (vmstat), etc.

The amount of performance metrics collected should be increased gradually in order not to impact database performance.

Similar recommendation can be given in regard to the capture time periods – we can start from some big capture period, such as 10 seconds and reduce it gradually (if needed) to lower values.

By acquiring multiple performance metrics and using HLC Analysis Module for spike correlation analysis user should be able to identify the exact timeline of the performance degradation event and identify what combination of SQL or system activity is the root cause of the issue.

Considering that database load is cyclical in nature, corresponding to the business cycles (as on many OLTP systems) it is also recommended to use historical superimposition for analysis to visually compare historical database system performance with the problem-time performance.

Database performance degradation within database cluster/logical group

Case: At some point in time, database performance and response time become inadequate for business requirements, while performance of other nodes in database cluster/group remains acceptable.

Recommendation:

It is advisable to capture performance metrics on the impacted node as well as on a normally functioning one. Using **HLC Analysis Module** user should be able to perform cross-node analysis of the captured performance metrics and identify exact differences between the nodes as well as root components that behave differently

Database performance degradation after application upgrade

Case: After application upgrade, accessing the database is degraded, database performance becomes inadequate.

Recommendation:

Compare captured performance data related to the time period before the upgrade (baseline) to the database performance after the upgrade.

Database performance degradation during unexpected high-impact performance/response time spikes

Case: Database is functioning normally most of the time. At the same time DBA/OPS need to be able to capture spike information as soon as it develops

Recommendation:

It is advisable to prepare initial on-going data capture configuration that would include limited number of trigger captures (such as "amount of active sessions" and "system load average for the past 5 minutes"). These trigger captures should control set of captures that would acquire detailed database/system performance metrics at the time when trigger capture thresholds are crossed-over. This set could include such performance metrics as database system statistics, system events, latches, executed SQL, segment I/O, I/O statistics (iostat), CPU related statistics (mpstat), paging (vmstat), etc.

The use of the above approach enables the user to capture exact database and system behavior during the spike time and by utilizing the HLC Analysis module for spike correlation the user should be able to identify the exact root cause of the spike.

QA database performance/stress testing

Case: Application developer needs to understand how a new application code is loading the database in comparison to the old application code.

Recommendation:

Compare database performance in the time period during the old application code run (baseline) to the database performance related to run of the new application code.

QA database performance/stress testing during database upgrade

Case: User needs to understand how a new application code is loading upgraded database comparing to the pre-upgrade time.

Recommendation:

Compare database performance during a pre-upgrade time period (baseline) to the database performance in the post-upgrade period.

Finding Top Resource Consuming SQL

Below sample capture entry SQL can be used to acquire information related to executing SQL:

"Select hash_value, executions, buffer_gets, disk_reads, parse_calls, sorts from v$sql"

Finding Top System Statistics

Below sample capture entry SQL can be used to acquire information related to system statistics:

"Select name, value from v$sysstat"

Finding Top Wait Events

Below sample capture entry SQL can be used to acquire information related to system wait events:

"Select EVENT, TIME_WAITED_MICRO from v$system_event"

Finding Top Latches

Below sample capture entry SQL can be used to acquire information *related to system latches:*

"Select NAME, MISSES from v$latch"

5

HLC Data Capture Initialization and Configuration Parameters

This chapter contains detailed descriptions of the DBAip High Load Capture initialization and configuration parameters and includes the following topics:

Uses of Initialization Parameters

Initialization parameters fall into various functional groups. For example, parameters perform the following functions:

- Configure SNMP parameters
- Configure management parameters of the capture log files

Users can use configuration parameters to perform following functions (for example):

- Create new capture connections
- Specify names of the capture log files
- Created dependencies between triggering and capture connections

Most of the parameters are optional. High Load Capture will provide notification to the user when mandatory parameter is missing in configuration or parameter file.

Parameter Files

A parameter file is a file that contains a list of initialization/configuration parameters and a value for each parameter. You specify parameters in a parameter file that reflects your particular configuration. High Load Capture supports the following two types of parameter files:

- Master Parameter Files
- Capture Connection Configuration Files

Master Configuration Files

A Master Parameter File is a text file that contains generic parameters related to the overall functionality of current High Load Capture installation.

Master configuration file is set by using "**-parm=<conf_file_name>**" HLC command line option.

Capture Connection Configuration Files

A Capture Connection Configuration File is a text file that contains list of data capture connections and corresponding connection configuration parameters.

Capture configuration file is set by using "**-conf=<conf_file_name>**" HLC command line option.

Changing Parameter Values

You can change the value of a parameter by editing the initialization parameter file. In most cases, the new value takes effect the next time you restart an HLC application. However, you can change the value of some parameters for the currently running application as described in the following section.

Dynamic Parameters

Some initialization parameters are **dynamic**, that is, they can be modified by altering their values in configuration file and sending USR2 signal to the running HLC application process.

Reading the Parameter Descriptions

The parameter descriptions in this chapter adhere to the following format.

PARAMETER_NAME

Parameter type	Specifies the type of the parameter:
Master Group	Specifies the group name, that the parameter belongs to
Syntax	Specifies the valid syntax for specifying the parameter.
Default value	Specifies the value this parameter assumes if not explicitly specified.
Parameter Class	Specifies whether the parameter is dynamic or static. If dynamic, its value can be changed by altering connection configuration file and sending USR2 signal to the active HLC process

For each parameter, following paragraphs further describes the parameter and the effects of different settings.

Master Configuration File Parameter Descriptions

Descriptions of the individual parameters follow in alphabetical order.

LOG_ARCHIVE_GENERATIONS

Parameter type	Integer
Mater Group	None
Syntax	'log_archive_generations' => '<value>'
Default value	3
Parameter Class	Static

Use LOG_ARCHIVE_GENERATIONS to set maximum size of the log generations to be kept

LOG_ARCHIVE_SIZE

Parameter type	Integer
Mater Group	None
Syntax	'log_archive_size' => '<value>'
Default value	5242880
Parameter Class	Static

Use LOG_ARCHIVE_SIZE to set maximum size of the capture log file

SNMP_ACTIVE

Parameter type	String
Mater Group	None
Syntax	'snmp_active' => 'Y|N'
Default value	'N'
Parameter Class	Static

Use SNMP_ACTIVE to enable SNMP traps sending

SNMP_TRAP_HOST

Parameter type	String
Mater Group	None
Syntax	'snmp_trap_host' => '<name|ip>'
Default value	localhost
Parameter Class	Static

Use SNMP_TRAP_HOST to set hostname or ip address of the SNMP trap server

SNMP_TRAP_PORT

Parameter type	Integer
Mater Group	None
Syntax	'snmp_trap_port' => '<port>'
Default value	162
Parameter Class	Static

Use SNMP_TRAP_PORT to set port of the SNMP trap server

SNMP_TRAP_COMMUNITY

Parameter type	String
Mater Group	None
Syntax	'snmp_trap_community' => '<community>'
Default value	public
Parameter Class	Static

Use SNMP_TRAP_PORT to set SNMP trap community

SNMP_TRAP_OID

Parameter type	String
Mater Group	None
Syntax	'snmp_trap_oid' => '<community>'
Default value	No default value
Parameter Class	Static

Use SNMP_TRAP_OID to set oid for the SNMP traps

SNMP_TRAP_PORT

Parameter type	Integer
Mater Group	None
Syntax	'snmp_trap_port' => '<port>'
Default value	162
Parameter Class	Static

Use SNMP_TRAP_PORT to set port of the SNMP trap server

Sample Master Configuration File

```
#
# general master configuration file
#
$VAR1 = [
        {
          'snmp_active'            => 'y'
          ,'snmp_trap_host'         => '192.168.1.140'
          ,'snmp_trap_port'         => '162'
          ,'snmp_trap_community'     => 'public'
          ,'snmp_trap_oid'          => '.1.3.6.1.4.1.24216'
          ,'log_archive_size'       => '5242880'
          ,'log_archive_generations' => '3'
        },
      ];
```

Capture Connection Configuration File Parameter Descriptions

Descriptions of the individual parameters follow in alphabetical order.

ACTIVE_FLAG/CONNECTION

Parameter type	String
Mater Group	CONNECTION
Syntax	'active_flag' => 'Y|N'
Default value	'Y'
Parameter Class	Dynamic

Use ACTIVE_FLAG to enable data capture connection

ACTIVATE_ON_STARTUP/CONNECTION

Parameter type	String
Mater Group	CONNECTION
Syntax	'activate_on_startup' => 'Y|N'
Default value	'N'
Parameter Class	Dynamic

Use ACTIVATE_ON_STARTUP to begin data collection immediately upon startup of HLC

ALERT_CAPTURE_CYCLE/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'alert_capture_cycle' => '<cycle>'
Default value	No default value
Parameter Class	Dynamic

Use ALERT_CAPTURE_CYCLE to set data collection cycle after alter event (caused by ALERT_THRESHOLD_ABS or ALERT_THRESHOLD_PCT parameter settings)

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ALERT_CAPTURE_PERIOD/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'alert_capture_period' => '<period>
Default value	No default value
Parameter Class	Dynamic

Use ALERT_CAPTURE_PERIOD to set period of data collection after alter event (caused by ALERT_THRESHOLD_ABS or ALERT_THRESHOLD_PCT parameter settings). During ALERT_CAPTURE_PERIOD data collection cycle is set to ALERT_CAPTURE_CYCLE, even if alert condition is no more active.

ALERT_SNMP_TRAP/CONNECTION

Parameter type	String
Mater Group	CONNECTION
Syntax	'alert_snmp_trap' => '<Y|N>
Default value	N
Parameter Class	Dynamic

Use ALERT_SNMP_TRAP to send SNMP trap upon alert event

ALERT_THRESHOLD_ABS/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'alert_threshold_abs' => '<period>
Default value	No default value
Parameter Class	Dynamic

Use ALERT_THRESHOLD_ABS to set absolute alert threshold to evaluate every data item collected by capture connection. Upon alert event, special records recorded into capture log file and data collection period if altered from CYCLE to ALERT_CAPTURE_CYCLE value

ALERT_THRESHOLD_PCT/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'alert_threshold_pct' => '<period>
Default value	No default value
Parameter Class	Dynamic

Use ALERT_THRESHOLD_PCT to set percent alert threshold to evaluate every data item collected by capture connection. Upon alert event, special records recorded into capture log file and data collection period if altered from CYCLE to ALERT_CAPTURE_CYCLE value

CAPTURE_GROUP/CONNECTION

Parameter type	Integer
Mater Group	CONNECTION
Syntax	'capture_group' => ['<cap_conn_cs_list>,]
Default value	No Default Value
Parameter Class	Dynamic

Use CAPTURE_GROUP to set list of capture connections (comma separated list) that can be controlled by triggering connection. If CAPTURE_GROUP is not set, triggering connection is controlling all capture connections.

CONNECTION

Parameter type	Group
Mater Group	None
Syntax	'connection' => {…}
Default value	No default value
Parameter Class	Dynamic

Use CONNECTION parameter to define a list of capture connection configuration parameters

CONNECTION_TYPE/CAPTURE

Parameter type	String
Mater Group	CAPTURE
Syntax	'connection_type' => '<c_type>'
Default value	No default value
Valid Values	capture, trigger
Parameter Class	Static

Use CONNECTION_TYPE parameter to define a type of the data collecting connection. Valid values are "**capture**" which defines connection that only collects data from the data source and "**trigger**", which defines connection, that in addition to pure data collection is also capable of controlling other capture connections.

CHARTING_CONCENTRATOR_INDEX/CONNECTION

Parameter type	Integer
Mater Group	CONNECTION
Syntax	'charting_concentrator_index' => '<index>
Default value	No default value
Parameter Class	Dynamic

Use CHARTING_CONCENTRATOR_INDEX to set index of the data item in the row of collected data, that would be used by HLC GUI to group other columns.

For example, in capture connection, that collectes absolute values of the SQL "select EVENT, count(*), sum(WAIT_TIME) from v$sesison_wait group by event", to use "EVENT" (index 1) as charting concentrator, parameter needs to be set as: 'charting_concentrator_index' => '1'

CYCLE/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'cycle' => '<capture_cycle >'
Default value	No default value
Parameter Class	Dynamic

Use CYCLE to set length of the data capture cycle of capture connection

DATABASE/PARAMS

Parameter type	Group
Mater Group	PARAMS
Syntax	'database' => '' 'database' => 'usr/pwd@tns'
Default value	No default value
Parameter Class	Static

Use DATABASE to define a connection string to be used by High Load Capture to connect to the database. Empty string instructs HLC to attempt to connect as SYSDBA; otherwise HLC would connect to database using provided username, password and database tnsnames alias.

DATA_SOURCE

Parameter type	Group
Mater Group	Connection
Syntax	'data_source' => {…}
Default value	No default value
Parameter Class	Dynamic

Use DATA_SOURCE parameter to define a list of data source configuration parameters

DELTA_FLAG/CONNECTION

Parameter type	Integer
Mater Group	CONNECTION
Syntax	'delta_flag' => '<index>
Default value	-1
Parameter Class	Dynamic

Use DELTA_FLAG to set index of the data item in the row of collected data that would be used as a "join" column in delta collection mode to subtract results of current data sample from the results of the previous data sample. If DELTA_FLAG is set to -1 or not used, data collection is done in a absolute value mode

FILE/CONNECTION

Parameter type	String
Mater Group	CONNECTION
Syntax	'file' => '<log_file_name>'
Default value	No default value
Parameter Class	Dynamic

Use FILE to define name of the connection capture log file

FILTER_THRESHOLD_ABS/CONNECTION

Parameter type	Double
Mater Group	CONNECTION
Syntax	'filter_threshold_abs' => '<period>
Default value	No default value
Parameter Class	Dynamic

Use FILTER_THRESHOLD_ABS to set absolute filter threshold to evaluate every data item collected by capture connection and filter all rows where every data item is lower then parameter value.

NAME/CONNECTION

Parameter type	String
Mater Group	None
Syntax	'name' => '<name>'
Default value	No default value
Parameter Class	Static

Use NAME parameter to define a name of the capture connection

NAME/PARAMS

Parameter type	Group
Mater Group	PARAMS
Syntax	'name' => '<external_name>'
Default value	No default value
Parameter Class	Static

Use NAME to define name of the external script of program to be executed by High Load Capture

NAME/DATA_SOURCE

Parameter type	String
Mater Group	DATA_SOURCE
Syntax	'name' => '<ds_type>'
Default value	No default value
Valid Values	database, external
Parameter Class	Static

Use NAME parameter to define a type of the data source. Valid values are "**database**" which defined data source as a data retrieved from the database and "**external**" as a data retrieved from the external script or program

PARAMS/DATA_SOURCE

Parameter type	Group
Mater Group	DATA_SOURCE
Syntax	'params' => {…}
Default value	No default value
Parameter Class	Static

Use PARAMS to define a list of data source parameters bases on a data source type.

SQL/PARAMS

Parameter type	Group
Mater Group	PARAMS
Syntax	'sql' => '<sql>'
Default value	No default value
Parameter Class	Static

Use SQL to define a SQL query to be executed by High Load Capture

Sample Capture Connection Configuration File

```
#
# Sample capture configuration file
#
$VAR1 = [
      {
       'connection' => {
        'data_source' => {
        'params' => {
            'database' => '',
            'sql' => 'select count(*) CNT, \'SESS\' SESS from v$session where status = \'ACTIVE\'' },
         'name'  => 'database'
        },
        'file' => '/export/home/oracle/capture/act_sess.log',
        'connection_type' => {
         'name' => 'triggering',
        },
        'capture_group' => [ 'UPTIME_LOAD' ],
        'cycle' => 5,
        'alert_threshold_abs' => 2,
        'activate_on_startup'  => 'y',
        'active_flag' => 'y'
       },
        'name' => 'ACTIVE_SESSIONS'
       },
       {
        'connection' => {
         'data_source' => {
          'params' => { 'name' => './uptime.ksh' }
          ,'name' => 'external'
          }
         ,'file' => '/export/home/oracle/capture/uptime.log'
         ,'connection_type' => { 'name' => 'capture' }
         ,'cycle' => 1
         ,'alert_capture_cycle' => 0.5
         ,'activate_on_startup' => 'y'
         ,'active_flag' => 'y',
         ,'charting_concentrator_index' => 1
        },
        'name' => 'UPTIME_LOAD'
       },
];
```

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Troubleshooting
High Load Capture for Oracle

This chapter contains information that can assist the user with issues that are related to High Load Capture startup and its connection to the databases.

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Installation related issues

If during the installation process Oracle Enterprise Manager client is active, the installer may stall. To resolve this issue, close Oracle EM client during the installation process

Startup related issues

High Load Capture may fail to startup if during the installation process the user chooses not to install the provided JRE (Java Runtime Environment). It is strongly recommended to use JRE packaged with High Load Capture.