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A Deep Dive Into the SQL Monitoring Report

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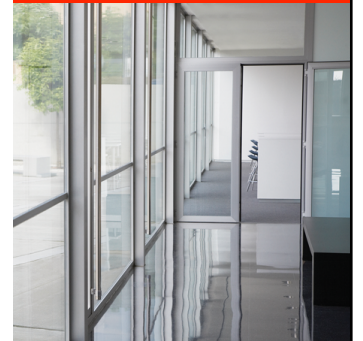


About Me

- Over 7 years in Real-World Performance Group
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- Blog: <http://structureddata.org>

Program Agenda

- Quick Intro
- Walkthroughs
- Summary



What is SQL Monitoring?

- Introduced in Oracle Database 11g
- Enables performance monitoring of SQL statements while they are executing
- Allows execution details stored in offline report

What statements get monitored?

- Monitors
 - Serial statements with 5 seconds of total CPU/IO time
 - All parallel statements
 - Includes queries / DML / DDL
 - Always on, enabled out of the box
- Hints
 - MONITOR
 - NO_MONITOR

How do I get a SQL Monitoring Report?

- GUI via Oracle Enterprise Manager
 - Performance Page
 - SQL Monitoring Link
 - Click on completed or currently executing statement
- Command line via SQL*Plus
 - `pagesize 0 linesize 1000 trimspool on trim on long 2000000 longchunksize 2000000`
 - `dbms_sqltune.report_sql_monitor(
 sql_id=>'2foo4uy583wtf', type=>'ACTIVE')`
 - Types: TEXT (default), or ACTIVE (same as EM)

SQL Monitoring Report

SQL Text

```
select /*+ monitor */ o_orderstatus, count(*) from l,o where o_orderkey = l_orderkey group by o_orderstatus
```

Global Information

```
Status          : DONE (ALL ROWS)
Instance ID     : 1
Session        : TPCH (773:7173)
SQL ID         : d78uhf7td94rs
SQL Execution ID : 16777221
Execution Started : 09/21/2011 15:02:57
First Refresh Time : 09/21/2011 15:02:57
Last Refresh Time : 09/21/2011 15:03:52
Duration       : 55s
Module/Action  : SQL*Plus/-
Service       : SYS$USERS
Program      : sqlplus@zulu.us.oracle.com (TNS V1-V3)
Fetch Calls   : 2
```

Global Stats

Elapsed Time(s)	Cpu Time(s)	IO Waits(s)	Other Waits(s)	Fetch Calls	Buffer Gets	Read Reqs	Read Bytes
56	55	0.78	0.02	2	889K	8067	8GB

SQL Plan Monitoring Details (Plan Hash Value=1558546965)

Id	Operation	Name	Rows (Estim)	Cost	Time Active(s)	Start Active	Execs	Rows (Actual)	Read Reqs	Read Bytes	Mem (Max)	Activity (%)	Activity Detail (# samples)
0	SELECT STATEMENT				54	+2	1	1					
1	HASH GROUP BY		1	284K	54	+2	1	1			5M	3.57	Cpu (2)
2	HASH JOIN		18M	283K	55	+2	1	22M			265M	67.86	Cpu (38)
3	TABLE ACCESS FULL	O	6M	9073	2	+1	1	6M	260	258MB		3.57	Cpu (2)
4	TABLE ACCESS FULL	L	160M	273K	54	+2	1	160M	7807	8GB		25.00	Cpu (14)

Monitored SQL Execution Details

Overview

SQL ID: d78uhf7td94rs	Time & Wait Statistics	IO Statistics
Execution Started: Wed Sep 21, 2011 3:02:57 PM	Duration: 55.0s	Buffer Gets: 889K
Last Refresh Time: Wed Sep 21, 2011 3:03:52 PM	Database Time: 55.9s	IO Requests: 8,067
Execution ID: 16777221	PL/SQL & Java: 0.0s	IO Bytes: 8GB
User: TPCH	Wait Activity %:	
Fetch Calls: 2		

Details

Plan Statistics | Plan | Activity | Metrics

Plan Hash Value: 1558546965

TIP: Right mouse click on the table allows to toggle between IO Requests and IO Bytes

Operation	Name	Estimated Rows	Cost	Timeline(5Ss)	Executi...	Actual Rows	Memory (...)	Temp (Max)	IO Requests	CPU Activity %	Wait Activity %
SELECT STATEMENT					1	1					
HASH GROUP BY		1	284K		1	1	5MB			3.57	
HASH JOIN		18M	283K		1	22M	253MB			68	
TABLE ACCESS FULL	O	5,610K	9,073		1	5,610K			260	3.57	
TABLE ACCESS FULL	L	160M	273K		1	160M			7,807	25	

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Monitored SQL Execution Details

Overview

SQL ID ddtc2mg5wr0g6
Parallel 32
Execution Started Sun Oct 2, 2011 9:00:51 PM
Last Refresh Time Sun Oct 2, 2011 9:00:55 PM
Execution ID 16777220
User TPCH
Fetch Calls 0

Time & Wait Statistics



IO Statistics



Details

Plan Statistics | Plan | Parallel | Activity | Metrics

Plan Hash Value 2803396957

TIP: Right mouse click on the table allows to toggle between IO Requests and IO Bytes

Operation	Name	Estimated Rows	Cost	Timeline(4s)	Executi...	Actual Rows	Memory	Temp	IO Requests	CPU Activity %	Wait Activity %
SELECT STATEMENT					1	0					
SORT AGGREGATE		1			1	0					
PX COORDINATOR					65	0					
PX SEND QC (RANDOM)	:TQ10004	1			0	0					
SORT AGGREGATE		1			0	0					
HASH JOIN		683	5,574		0	0					
JOIN FILTER CREATE	:BF0000	43M	1,813		0	0					
PX RECEIVE		43M	1,813		0	0					
PX SEND HASH	:TQ10002	43M	1,813		0	0					
PX BLOCK ITERATOR		43M	1,813		0	0					
TABLE ACCESS FULL	EDGES	43M	1,813		0	0					
PX RECEIVE		380M	3,697		0	0					
PX SEND HASH	:TQ10003	380M	3,697		32	0					
JOIN FILTER USE	:BF0000	380M	3,697		32	0					
HASH JOIN BUFFERED		380M	3,697		32	0	3GB	640MB		65	
PX RECEIVE		43M	1,813		32	43M				2.94	
PX SEND HASH	:TQ10000	43M	1,813		32	43M				2.94	
PX BLOCK ITERATOR		43M	1,813		32	43M					73
TABLE ACCESS FULL	EDGES	43M	1,813		416	43M				8.82	
PX RECEIVE		43M	1,813		32	27M				5.88	
PX SEND HASH	:TQ10001	43M	1,813		32	28M				5.88	27
PX BLOCK ITERATOR		43M	1,813		32	28M					
TABLE ACCESS FULL	EDGES	43M	1,813		286	28M				8.82	



Monitored SQL Executions

Oracle Enterprise Manager

- Let's take a look...

Status Duration Parallel Info DB Time IO Requests Start/End SQL Text

Database Instance: orcl > Monitored SQL Execution

Active in last 1 hour

Refresh 5 seconds Stop Refresh

Status	Duration	SQL ID	User	Parallel	Database Time	IO Requests	Start	Ended	SQL Text
Queued	1.0s	g4b7g2dv108b	TPCH		0.0s		5:47:54 PM		select /*+ monitor */ supp_nation, cust_nation, l_year, sum(volume) as revenue from (select
Running	1.0s		TPCH		0.0s		5:47:54 PM		select /*+ monitor */ supp_nation, cust_nation, l_year, sum(volume) as revenue from (select
Running	1.0s		TPCH	3	0.0s		5:47:54 PM		select /*+ monitor */ supp_nation, cust_nation, l_year, sum(volume) as revenue from (select
Running	4.0s		TPCH	3	10.2s	899	5:47:50 PM	5:47:54 PM	select sum(l_extendedprice * l_discount) as revenue from lineitem where l_shipdate >= date '1994-01-01' a
Running	4.0s		TPCH	3	5.8s	862	5:47:50 PM	5:47:54 PM	select sum(l_extendedprice * l_discount) as revenue from lineitem where l_shipdate >= date '1994-01-01' a
Running	6.0s		TPCH	3			5:47:48 PM	5:47:54 PM	select sum(l_extendedprice * l_discount) as revenue from lineitem where l_shipdate >= date '1994-01-01' a
Error	3.0s		TPCH	3	2.2s		5:47:51 PM	5:47:54 PM	select l_returnflag, l_linestatus, sum(l_quantity) as sum_qty, sum(l_extendedprice) as sum_base_price, sum(l
Running	3.0s		TPCH	4	9.2s	913	5:47:48 PM	5:47:51 PM	select count(*) from lineitem
Running	6.0s	fykt0pj5pq3d8	TPCH		8.2s	1,078	5:47:44 PM	5:47:50 PM	select n_name, sum(l_extendedprice * (1 - l_discount)) as revenue from customer, orders, lineitem, s
Running	7.0s		TPCH		11.6s	1,203	5:47:43 PM	5:47:50 PM	select n_name, sum(l_extendedprice * (1 - l_discount)) as revenue from customer, orders, lineitem, s
Running	5.0s	czgq37qq7vt1k	TPCH	3	12.6s	1,235	5:47:42 PM	5:47:48 PM	select n_name, sum(l_extendedprice * (1 - l_discount)) as revenue from customer, orders, lineitem, s
Running	5.0s		TPCH	3	12.1s	899	5:47:40 PM	5:47:45 PM	select l_returnflag, l_linestatus, sum(l_quantity) as sum_qty, sum(l_extendedprice) as sum_base_price, sum(l
Running	6.0s	duzr3utup8jnw	TPCH	3	7.4s	1,060	5:47:38 PM	5:47:44 PM	select o_orderpriority, count(*) as order_count from orders where o_orderdate >= date '1993-07-01' and o
Running	4.0s	duzr3utup8jnw	TPCH	3	9.4s	1,134	5:47:39 PM	5:47:43 PM	select o_orderpriority, count(*) as order_count from orders where o_orderdate >= date '1993-07-01' and o
Running	4.0s		TPCH	3			5:47:36 PM	5:47:41 PM	select o_orderpriority, count(*) as order_count from orders where o_orderdate >= date '1993-07-01' and o
Running	4.0s		TPCH	4			5:47:33 PM	5:47:39 PM	select count(*) from lineitem
Running	6.0s	9g96taakjpuq	TPCH	2		1,171	5:47:32 PM	5:47:38 PM	select * from (select l_orderkey, sum(l_extendedprice * (1 - l_discount)) as revenue, o_orderdate, o_shipprc
Running	4.0s	9g96taakjpuq	TPCH	4	11.3s	1,249	5:47:32 PM	5:47:36 PM	select * from (select l_orderkey, sum(l_extendedprice * (1 - l_discount)) as revenue, o_orderdate, o_shipprc
Running	8.0s	czgq37qq7vt1k	TPCH	4	9.0s	862	5:47:27 PM	5:47:35 PM	select l_returnflag, l_linestatus, sum(l_quantity) as sum_qty, sum(l_extendedprice) as sum_base_price, sum(l
Running	1.0s	9rc325ccqfjky	TPCH	4	0.6s	279	5:47:32 PM	5:47:32 PM	select * from (select s_accbal, s_name, n_name, p_partkey, p_mfgr, s_address, s_phone, s
Running	2.0s	9rc325ccqfjky	TPCH	4	3.4s	279	5:47:30 PM	5:47:32 PM	select * from (select s_accbal, s_name, n_name, p_partkey, p_mfgr, s_address, s_phone, s
Running	5.0s	czgq37qq7vt1k	TPCH	4	11.8s	913	5:47:27 PM	5:47:32 PM	select l_returnflag, l_linestatus, sum(l_quantity) as sum_qty, sum(l_extendedprice) as sum_base_price, sum(l
Running	3.0s	czgq37qq7vt1k	TPCH	4	10.7s	913	5:47:27 PM	5:47:30 PM	select l_returnflag, l_linestatus, sum(l_quantity) as sum_qty, sum(l_extendedprice) as sum_base_price, sum(l

Queued

Running

Error

Queued/Execution

Completed

PX Downgraded

Parallel Degree

Database | Setup | Preferences | Help | Logout

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[About Oracle Enterprise Manager](#)



Active SQL Monitoring Report

Basic Overview

- Serial Execution
- Parallel Execution
- PL/SQL

Walkthrough Scenarios

- PDML disabled vs. PDML enabled
- Bad cardinality
- Undersized PGA
- Parallel skew

Benefits of SQL Monitor Reports

- Always on
- Currently executing statements
- Recently completed statements
- Execution information
- Execution plans
- Performance profile
- Both on-line and off-line

Q&A

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