ACOUG
All China Oracle User Group
中国 Oracle 用户组

YUNHE ENMO (BEIJING) TECHNOLOGY CO.,LTD

从性能监控到性能管理——Ignite

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个人介绍

- 杨廷琨(yangtingkun)
  - Oracle ACE Director
  - ITPUB数据库管理区版主
  - ACOUG核心会员
  - 参与编写《Oracle数据库性能优化》、《Oracle DBA手记》和《Oracle DBA手记3》
  - 个人BLOG中积累了2500篇原创技术文章
  - 十三年的一线DBA经验
  - 云和恩墨运维服务中心总经理

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监控的必要性

- 故障告警
- 问题定位
- 诊断佐证
- 趋势预测

监控软件的选择

- Shell脚本
- OEM
- Spotlight
- Ignite

Ignite的优势

- 统一的性能监控平台
- 有效的监控性能的变化趋势
- 及时的提供性能变化的预警
- 监控对服务器的影响小

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统一的性能监控平台

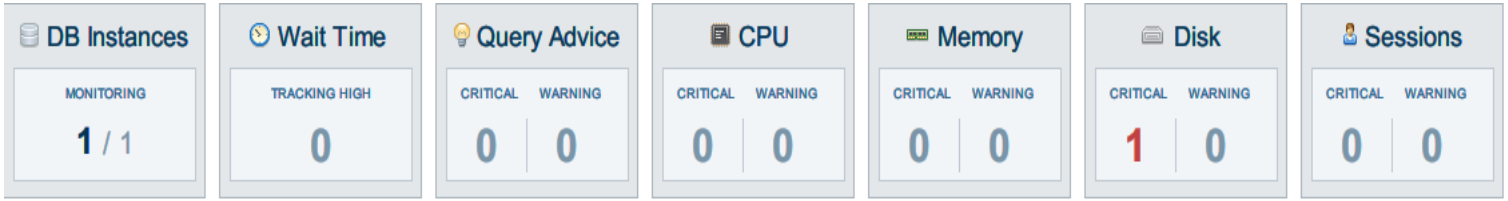
- **Platform Support**

  Ignite支持所有平台上的Oracle、SQL Server、DB2 LUW和Sybase数据库

Database Instance		Wait	Queries	CPU	Mem	Disk	Sess	Type
WASUDB_P570B03	Action							Oracle 10g R2
WASUDB_P570A02	Action							Oracle 10g R2
WASUDB_P570A01	Action							Oracle 10g R2
VODAPP_T5440-1	Action							Oracle 9i R2
VODAPP_OWNERHOST	Action							Oracle 9i R2

- **Resource Status**

  在显眼处，显示数据库服务器主要资源的状态信息。



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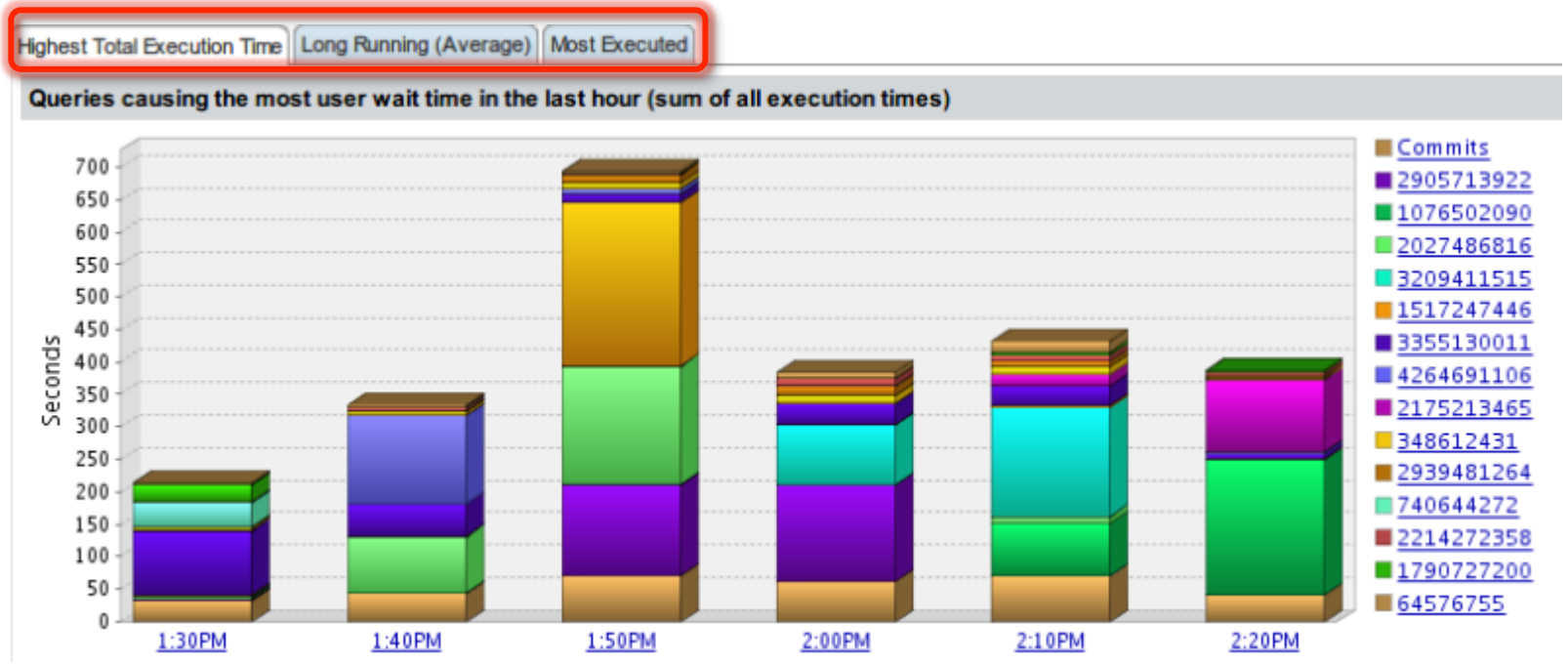
有效监控性能变化趋势

- Queries

  需要关注执行时间、平均运行时长，执行次数



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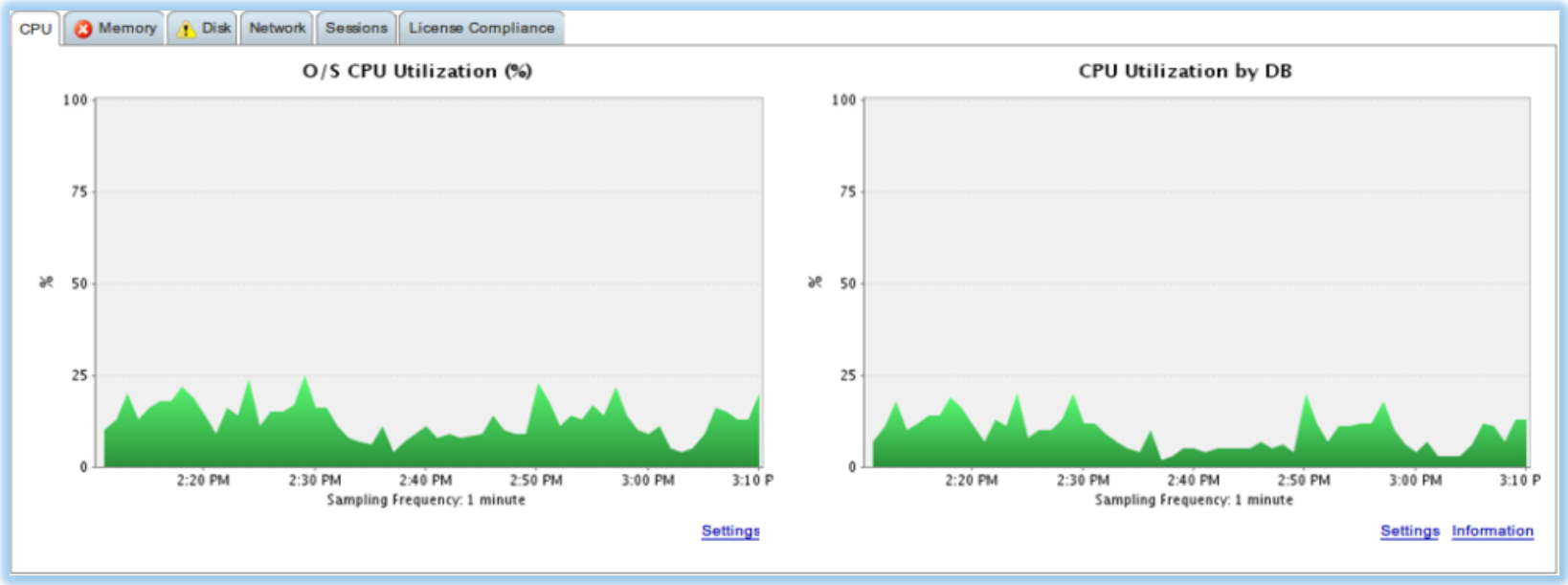
有效监控性能变化趋势

- CPU Usage

  操作系统CPU使用率多少？DB CPU使用率多少？



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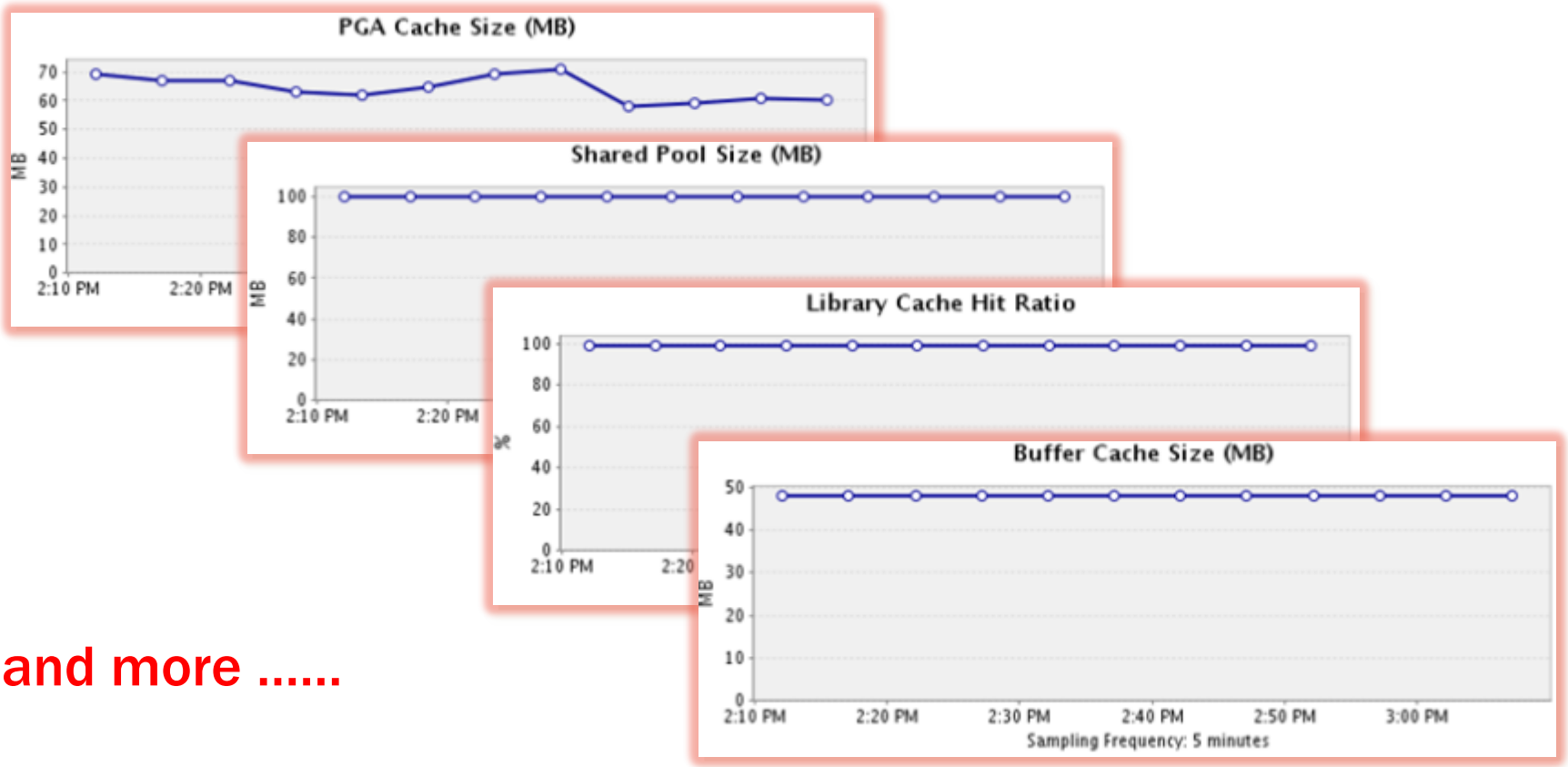
有效监控性能变化趋势

- Memory Usage



and more .....

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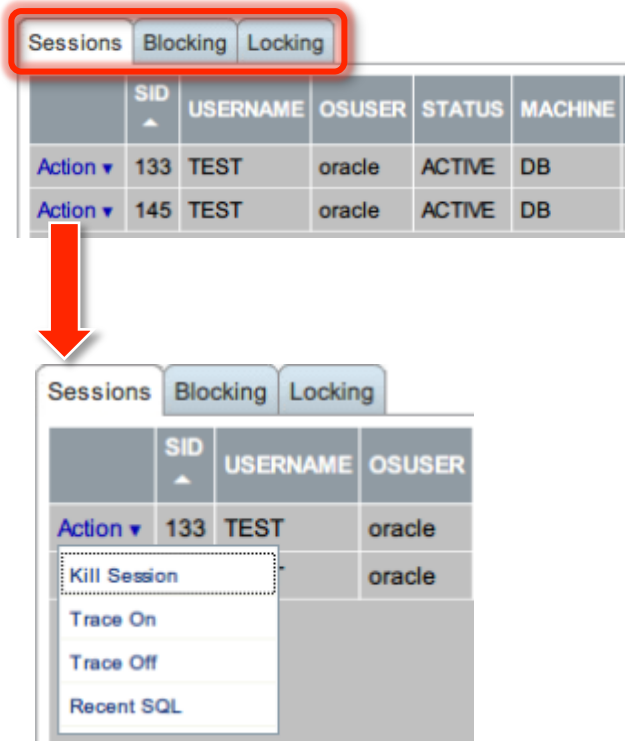
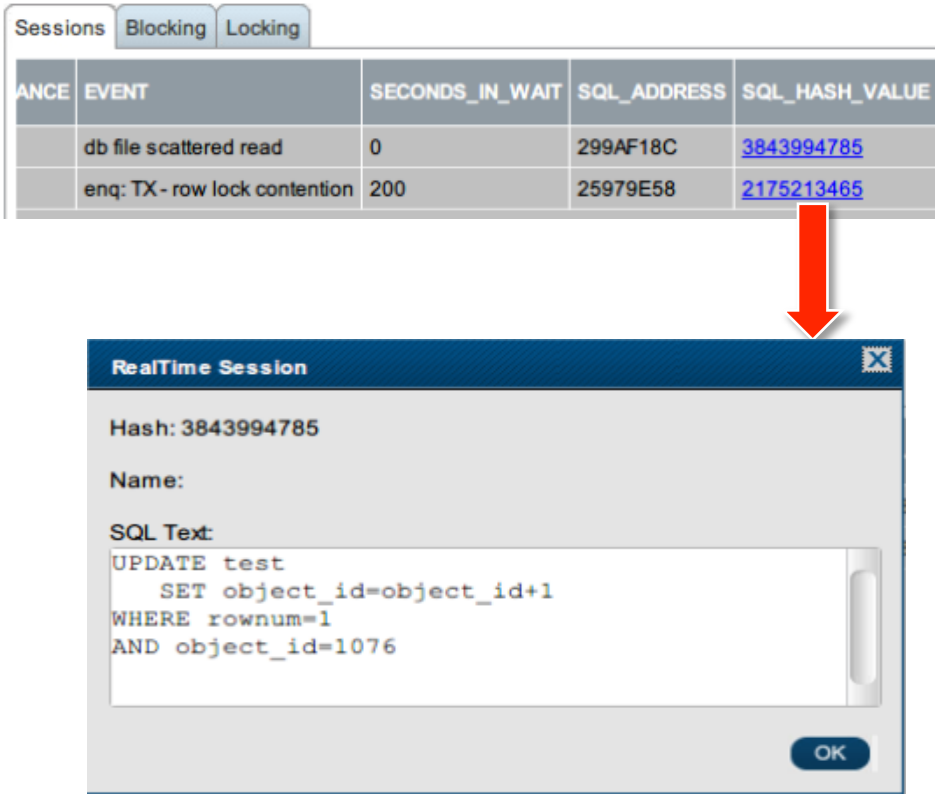
当前状态与性能预警

- Current Session

  数据库当前会话，阻塞会话，锁住的对象

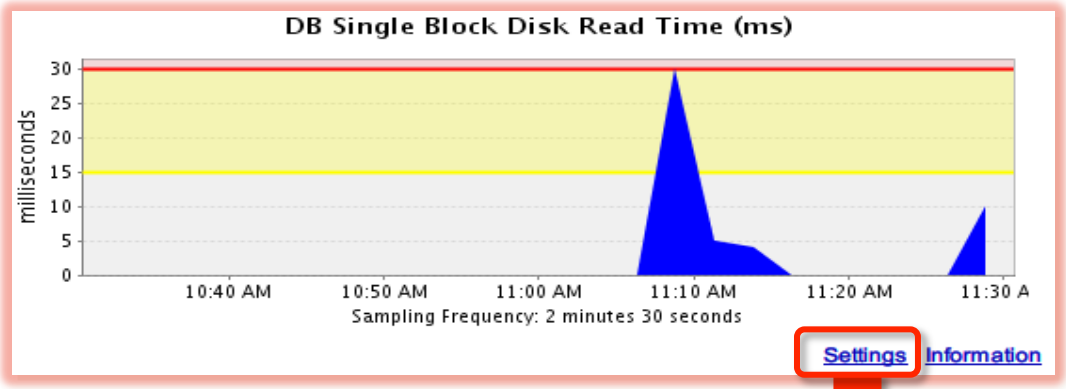


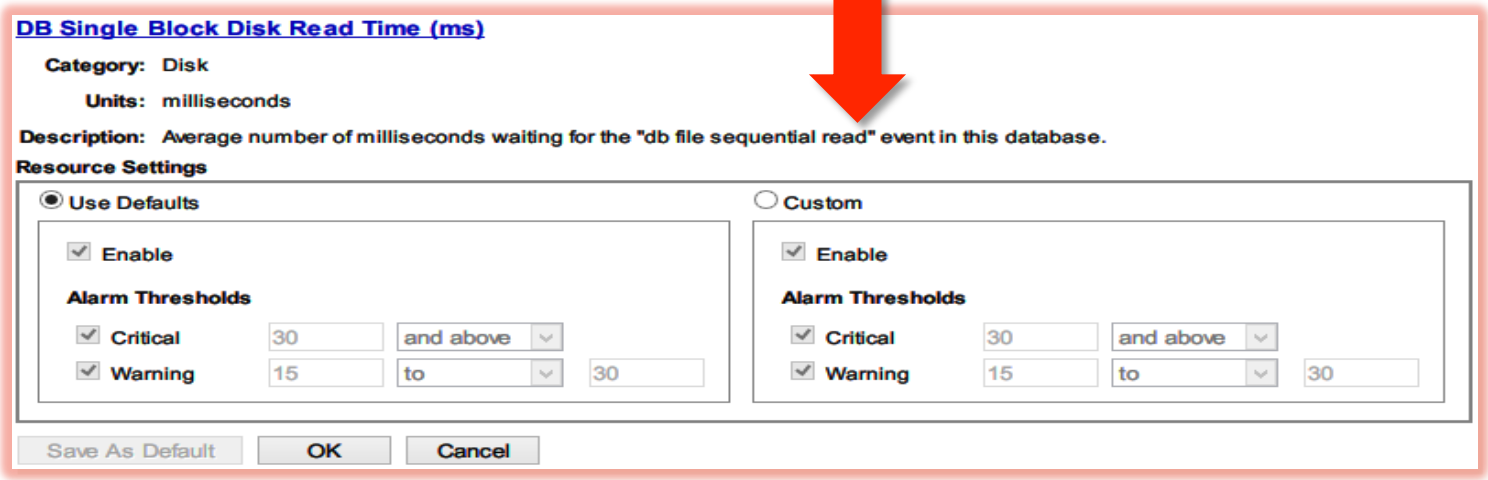


当前状态与性能预警

- **Threshold**

  设定多种阈值，判断当前性能指标是否超出预期值。

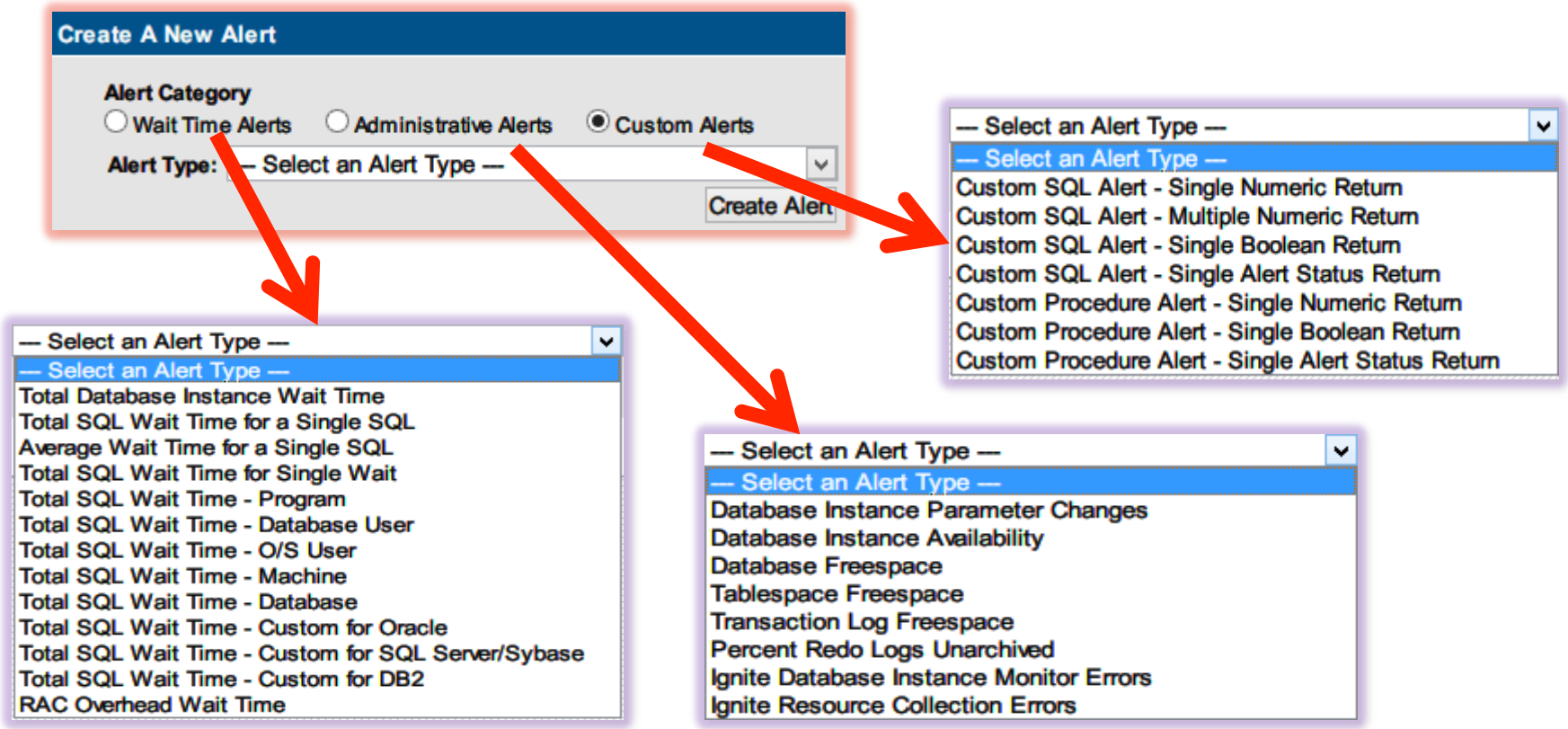




当前状态与性能预警

- Alert

  当性能指标超出设定阈值时，及时通知维护人员。



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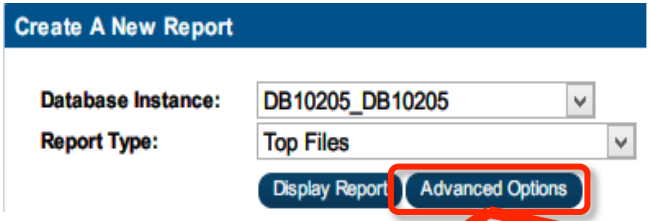
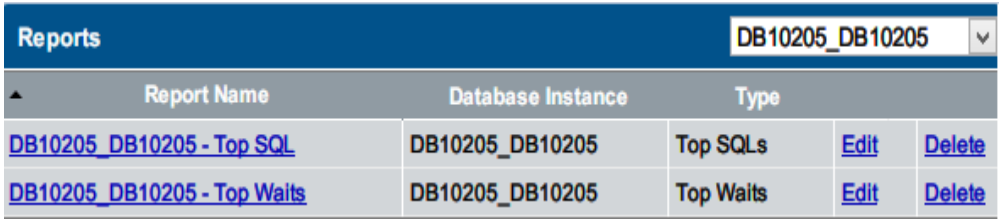
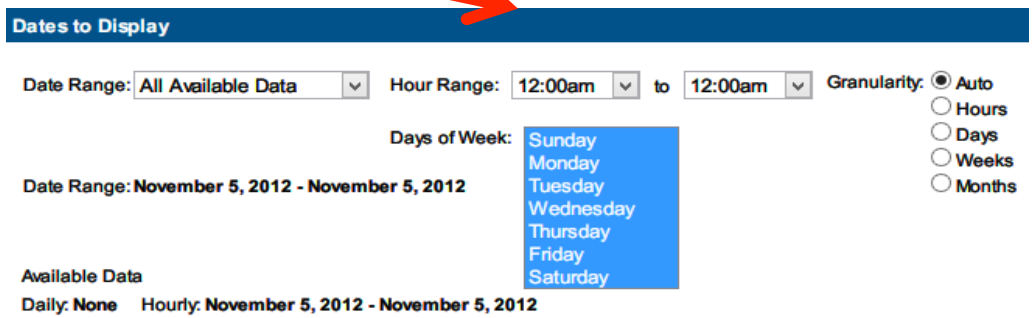
当前状态与性能预警

- Report

对数据库一段时间内的运行情况生成性能报表或其他报表。







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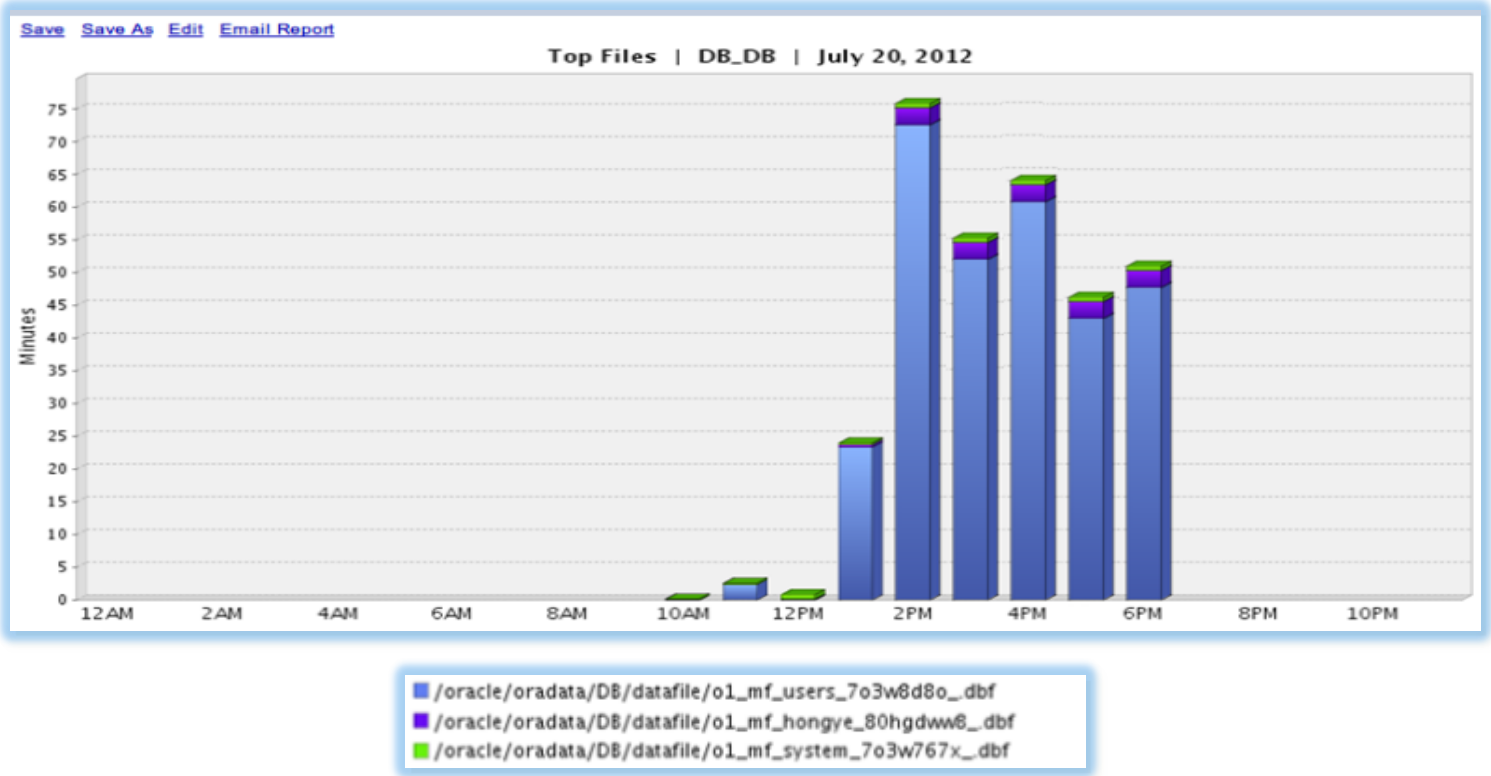
当前状态与性能预警

- Report



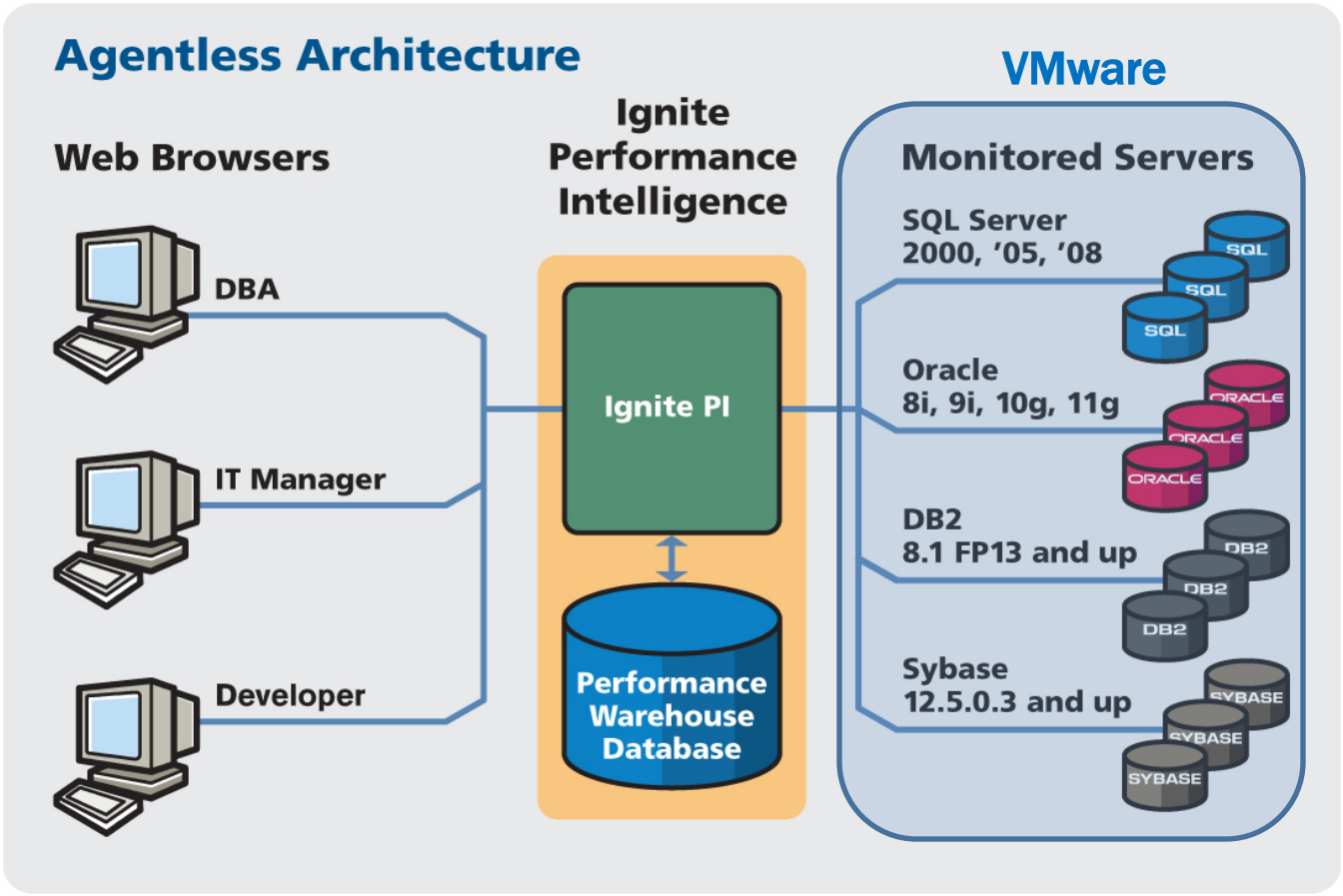
监控对服务器的影响小

Ignite是一个多级架构，它包括：Ignite服务器、网页客户端、Ignite性能数据仓库（也叫做Ignite知识库）和监控的数据库实例。

- 监控软件不安装在被监控服务器
- 历史数据不存储在被监控数据库
- 对历史数据库的分析查询不影响被监控库

仅仅只会对服务器造成不到1%的负载

无Agent，无客户端，无负载

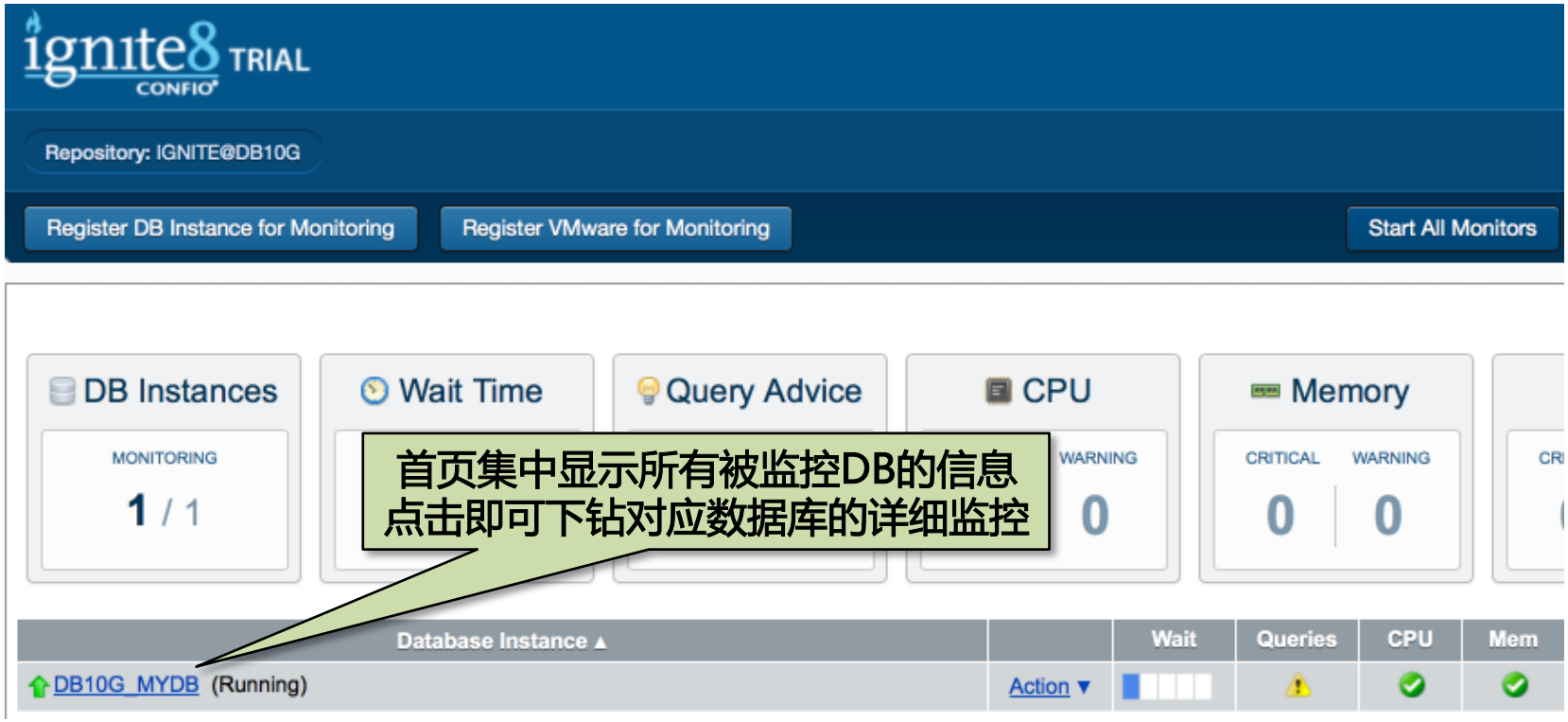


Ignite性能监控与优化步骤

- 如何开始？
- 如何定位？
- 如何优化？

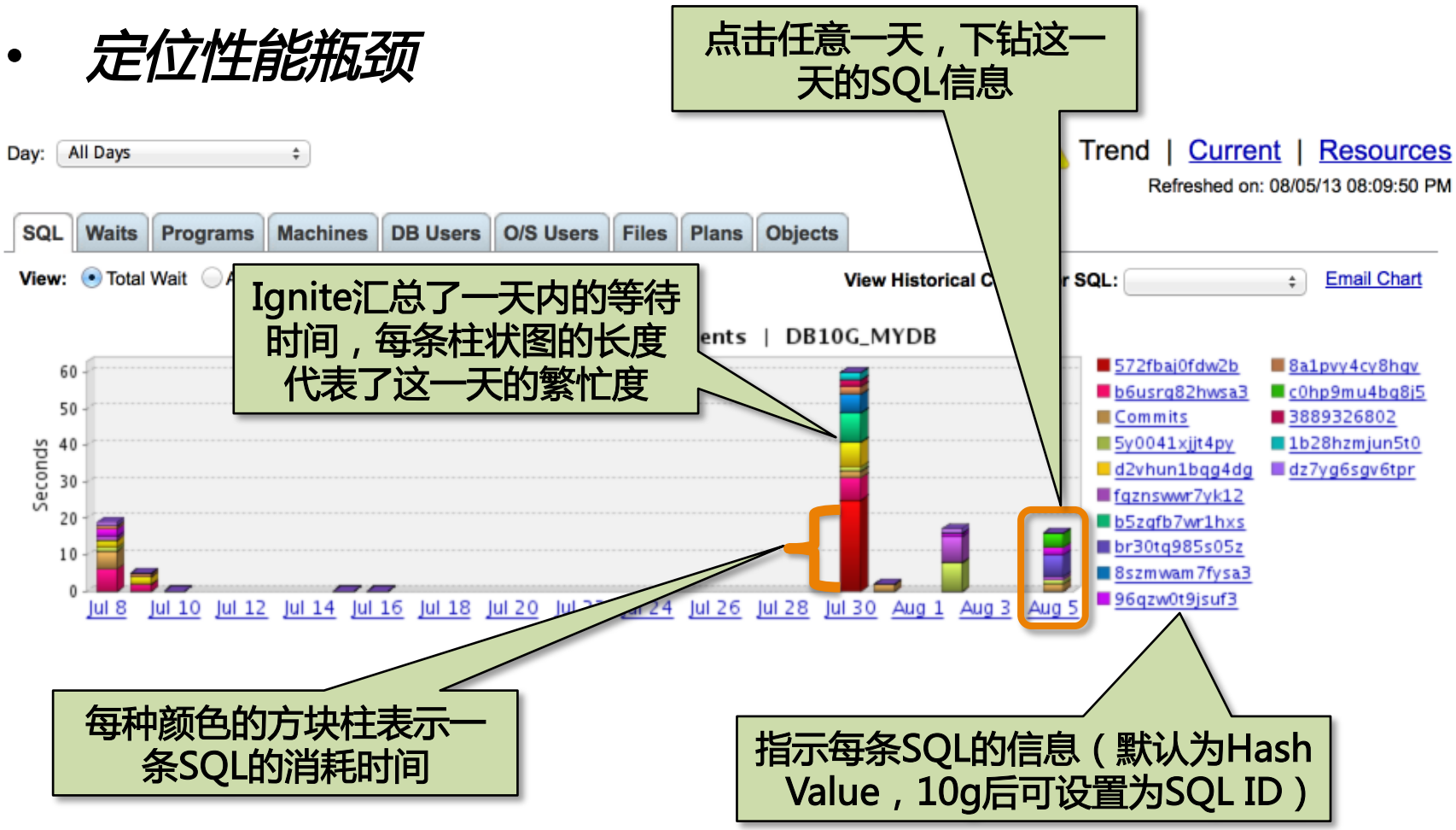
如何开始?

- *从首页开始*


ignite8 TRIAL
CONFIO
Repository: IGNITE@DB10G
Register DB Instance for Monitoring
Register VMware for Monitoring
Start All Monitors
DB Instances
MONITORING
1 / 1
Wait Time
Query Advice
CPU
WARNING
0
Memory
CRITICAL
WARNING
0
0
首页集中显示所有被监控DB的信息
点击即可下钻对应数据库的详细监控
Database Instance ▲
Wait
Queries
CPU
Mem
DB10G_MYDB (Running)
Action ▼

如何定位?

- ***定位性能瓶颈***


点击任意一天，下钻这一天的SQL信息
Day: All Days
Trend | Current | Resources
Refreshed on: 08/05/13 08:09:50 PM
SQL
Waits
Programs
Machines
DB Users
O/S Users
Files
Plans
Objects
View: Total Wait
View Historical C
r SQL:
Email Chart
ents | DB10G_MYDB
Ignite汇总了一天内的等待时间，每条柱状图的长度代表了这一天的繁忙度
Seconds
60
50
40
30
20
10
0
Jul 8
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Jul 20
Jul 26
Jul 28
Jul 30
Aug 1
Aug 3
Aug 5
572fbaj0fdw2b
8a1pvy4cy8hqv
b6usrq82hwsa3
c0hp9mu4bq8j5
Commits
3889326802
5y0041xjjt4py
1b28hzmjun5t0
d2vhun1bqg4dg
dz7yg6sgv6tpr
fqznswwr7yk12
b5zqfb7wr1hxs
br30tq985s05z
8szmwam7fysa3
96qzw0t9jsuf3
每种颜色的方块柱表示一条SQL的消耗时间
指示每条SQL的信息（默认为Hash Value，10g后可设置为SQL ID）

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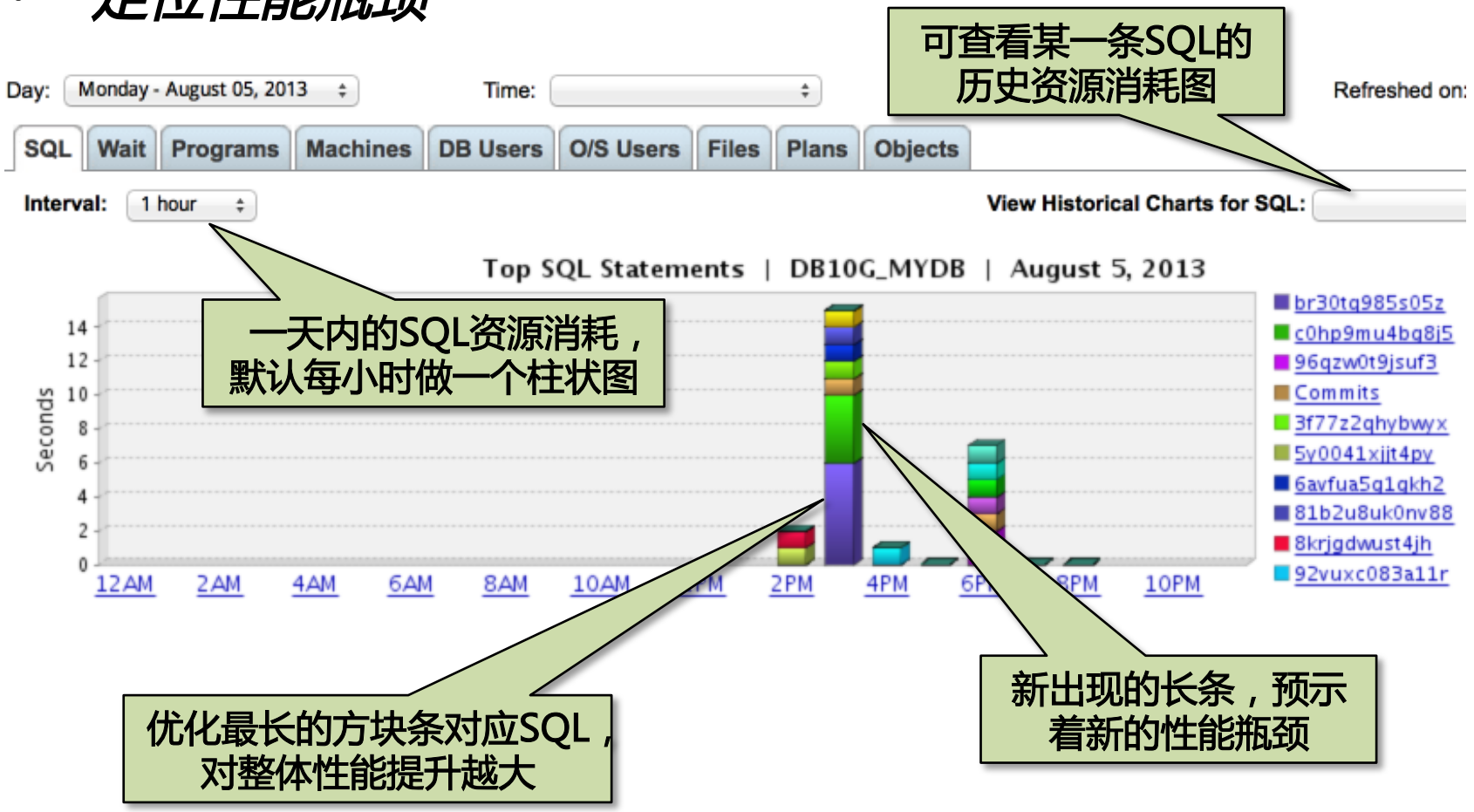
如何定位?

- ***定位性能瓶颈***



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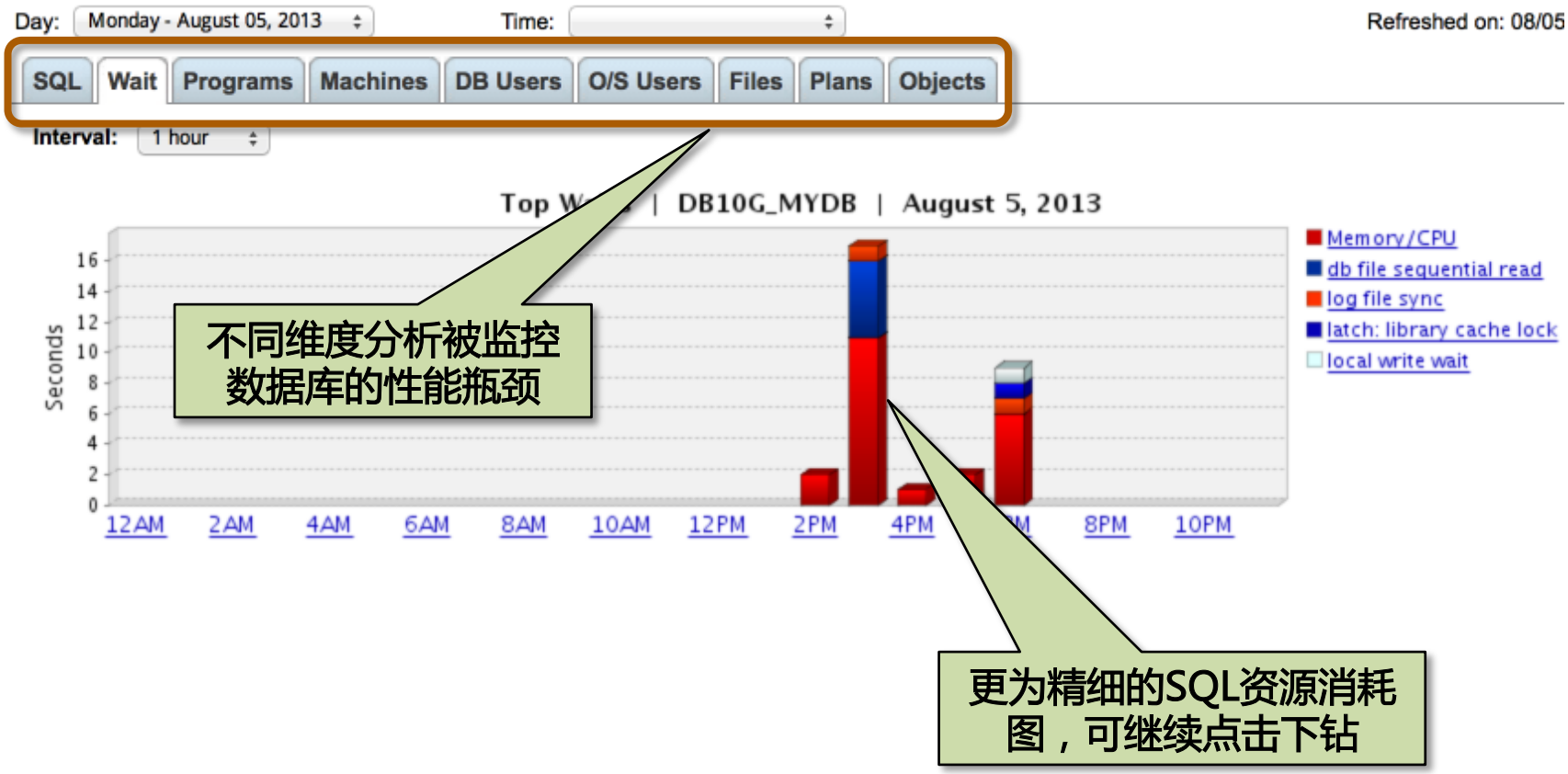
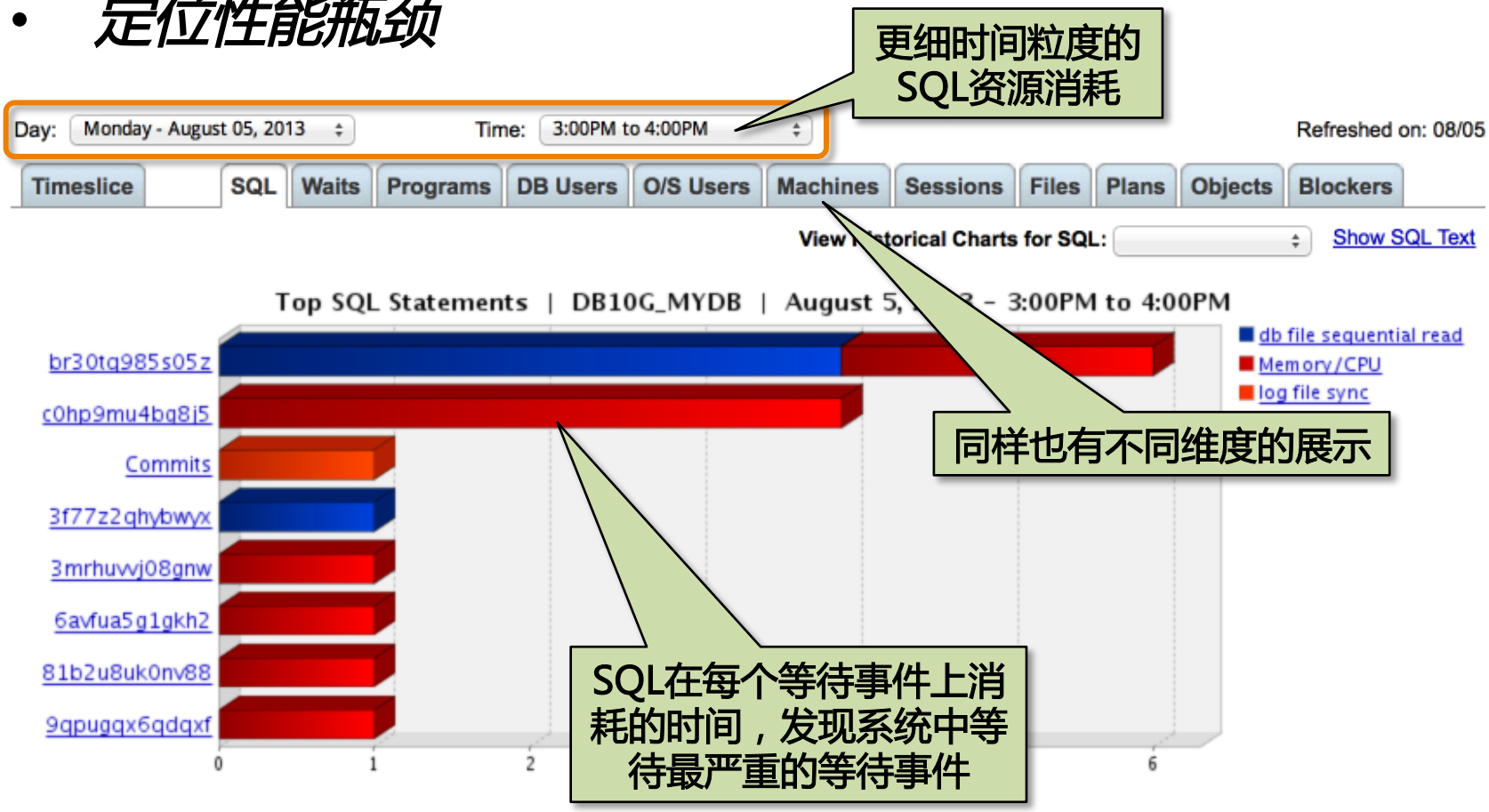
如何定位?

- ***定位性能瓶颈***



如何定位?

- ***定位性能瓶颈***


更细时间粒度的SQL资源消耗
Day: Monday - August 05, 2013
Time: 3:00PM to 4:00PM
Refreshed on: 08/05
Timeslice
SQL
Waits
Programs
DB Users
O/S Users
Machines
Sessions
Files
Plans
Objects
Blockers
Show SQL Text
Top SQL Statements | DB10G_MYDB | August 5,
3:00PM to 4:00PM
br30tq985s05z
c0hp9mu4bq8j5
Commits
3f77z2qhybwyx
3mrhuvvj08gnw
6avfua5g1gkh2
81b2u8uk0nv88
9qpugqx6qdqxf
0
1
2
6
db file sequential read
Memory/CPU
log file sync
同样也有不同维度的展示
SQL在每个等待事件上消耗的时间，发现系统中等待最严重的等待事件

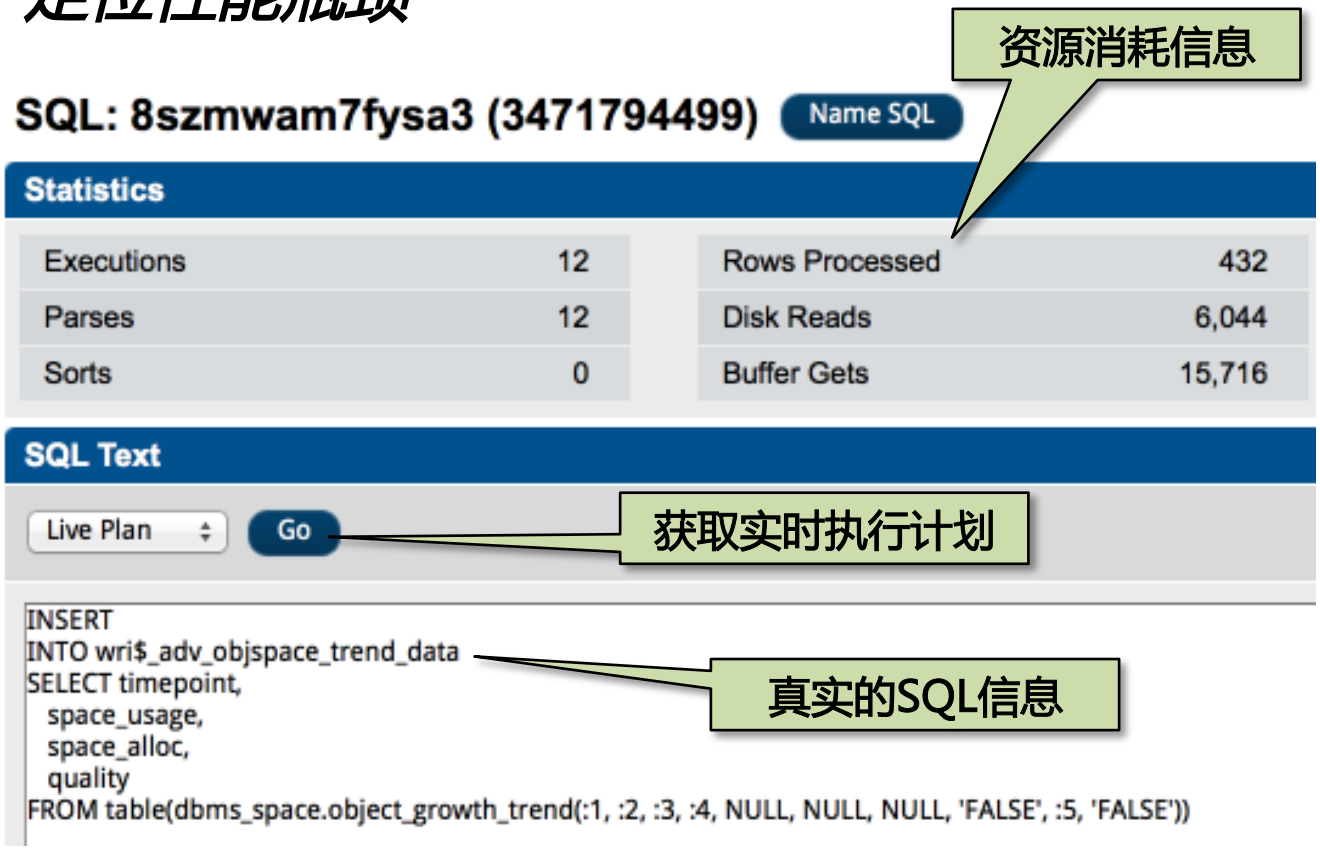
如何定位?

- ***定位性能瓶颈***


直接下钻具体SQL信息
Day: Monday - August 05, 2013
Time: 3:00PM to 4:00PM
Refreshed on: 08/05
Timeslice
SQL
Waits
Programs
DB Users
O/S Users
Machi
Sessions
Files
Plans
Objects
Blockers
ew Historical Charts for SQL:
Show SQL Text
Top SQL Statements | DB10G_MY | August 5, 2013 - 3:00PM to 4:00PM
br30tq985s05z
c0hp9mu4bq8j5
Commits
3f77z2qhybwyx
3mrhuvvj08gnw
6avfua5g1gkh2
81b2u8uk0nv88
9qpugqx6qdqxf
0
1
6
db file sequential read
Memory/CPU
log file sync
Description
db file sequential read
Waits on 'db file sequential read' normally occur during index lookups when the block is not in memory and must be read from disk. They are generally considered a 'good' read unless the index being used is not very efficient. In this case the query will read more blocks than necessary and possibly age out other good blocks from the cache.
Resolved By
Developers and sometimes DBA's
Solutions
1. Tune the SQL statement so that it reads fewer blocks. If the top objects listed in the Ignite Object tab are indexes, determine if there is a more efficient index that can be used. If the top objects are tables, Oracle is going back to the table to get more data after the index lookup completes. That may indicate criteria in the WHERE clause that is not using a column in this index. Adding that to the index could help performance.
2. INSERT statements can also wait on this event because it is being forced to update inefficient indexes. Review the Ignite Object tab to determine which indexes are being waited for. If they are inefficient, Oracle is most likely not utlizing them in other SQL statements, so consider dropping them.
3. Increase the buffer cache so that more blocks are already in memory rather having to be read from disk. The query will still need to read the same number of blocks so tuning is the first
Close

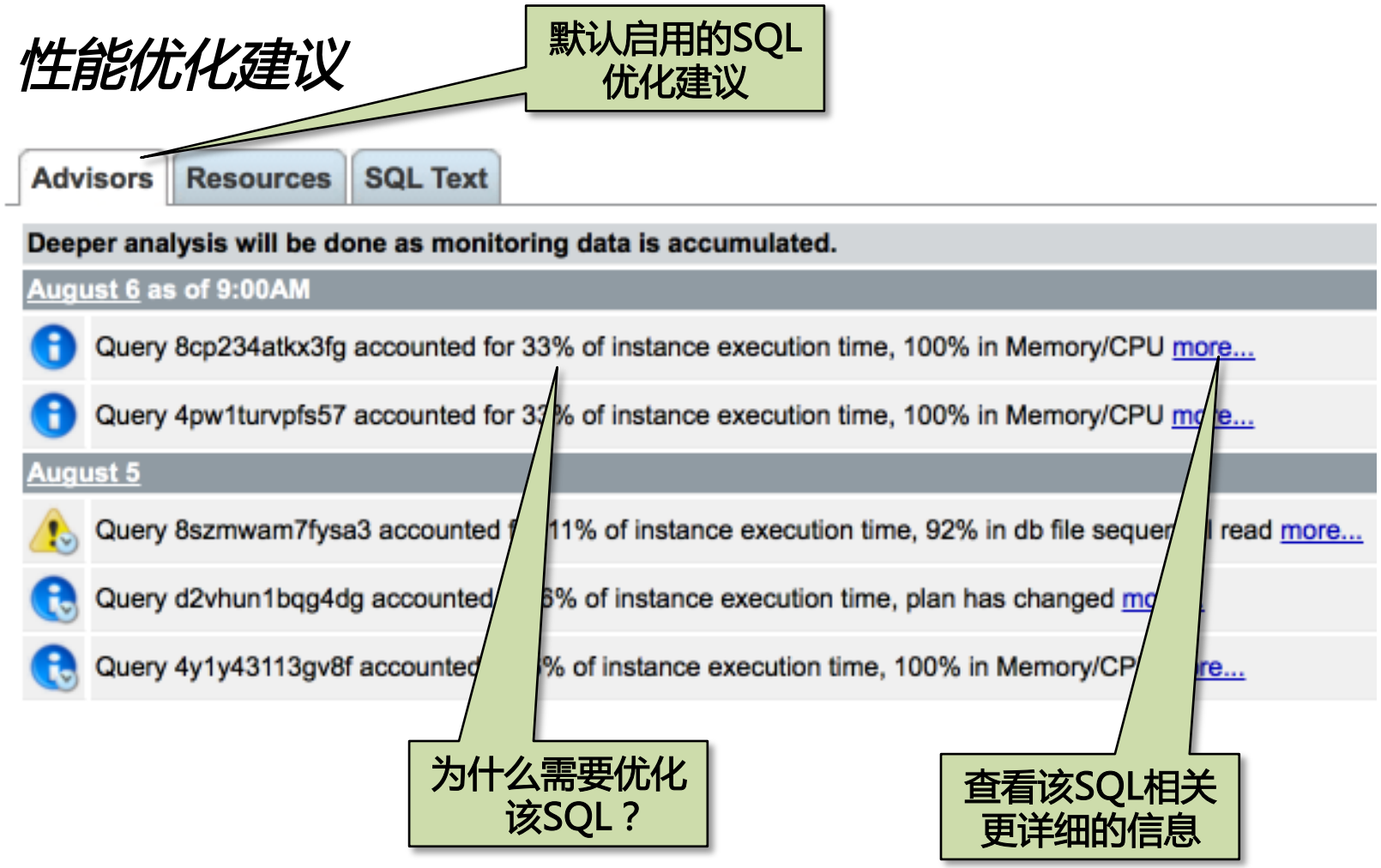
如何定位?

- ***定位性能瓶颈***


资源消耗信息
SQL: 8szmwam7fysa3 (3471794499)
Name SQL
Statistics
Executions 12
Parses 12
Sorts 0
Rows Processed 432
Disk Reads 6,044
Buffer Gets 15,716
SQL Text
Live Plan
Go
获取实时执行计划
INSERT
INTO wri$_adv_objspace_trend_data
SELECT timepoint,
space_usage,
space_alloc,
quality
FROM table(dbms_space.object_growth_trend(:1, :2, :3, :4, NULL, NULL, NULL, 'FALSE', :5, 'FALSE'))
真实的SQL信息

如何优化?

- *性能优化建议*


默认启用的SQL优化建议
Advisors
Resources
SQL Text
Deeper analysis will be done as monitoring data is accumulated.
August 6 as of 9:00AM
Query 8cp234atkx3fg accounted for 33% of instance execution time, 100% in Memory/CPU more...
Query 4pw1turvpfs57 accounted for 33% of instance execution time, 100% in Memory/CPU more...
August 5
Query 8szmwam7fysa3 accounted for 11% of instance execution time, 92% in db file sequential read more...
Query d2vhun1bqg4dg accounted for 6% of instance execution time, plan has changed more...
Query 4y1y43113gv8f accounted for % of instance execution time, 100% in Memory/CPU more...
为什么需要优化该SQL？
查看该SQL相关更详细的信息

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如何优化?

- *性能优化建议*

是否获取了不必要的数据？

Advice for this Query

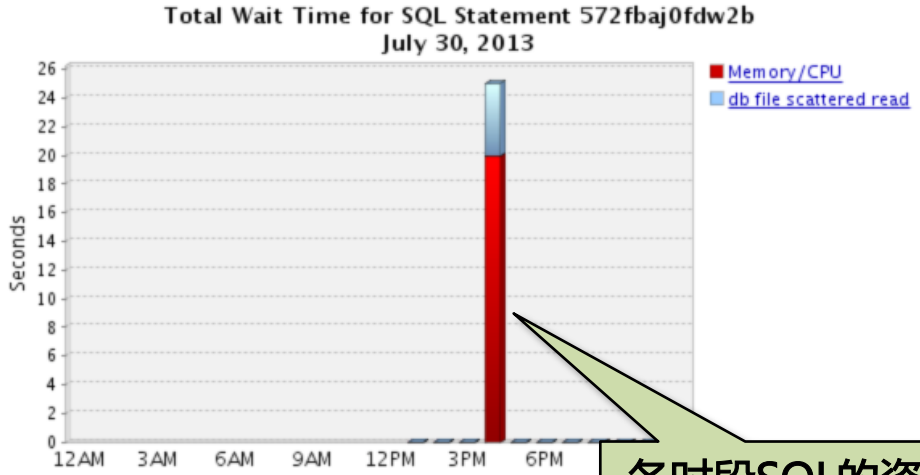
Might be retrieving too much data. Investigate adding a WHERE clause.

- Had 1,280 rows processed per execution

Spent a significant amount of time on these wait activities

- Memory/CPU (20 seconds)
- db file scattered read (5 seconds)

是否出现了异常的等待？



各时段SQL的资源消耗图

如何优化?

- *性能优化建议*

异常SQL的来源

Supporting Data

Database Users:	SYS
Files:	/u01/app/oracle/oradata/db10g/sysaux01.dbf , /u01/app/oracle/oradata/db10g/system01.dbf
Machines:	MyDB
O/S Users:	oracle
Objects:	N/A
Plans:	1648993636
Programs:	sqlplus@MyDB (TNS V1-V3)

Statistic	Value	per Execution
Executions	6	
Buffer Gets	2,525,695	420,949
Disk Reads	679	113
Parses	6	1
Rows Processed	7,683	1,280
Sorts	0	0

异常SQL的资源消耗情况

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案例演示

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Q&A