Troubleshooting of Standalone Databases, RAC and Exadata

Oleg Bezemchuk
Sysco AS
Vollsveien 2A, 1366 Lysaker, Norway

Introduction

The goal of the presentation is to show standard tools for troubleshooting and the ways of improving them.
If you like performance tuning and troubleshooting this presentation can be interesting.
You can hear some techniques of troubleshooting from ex-Oracle Advanced Support guy. Several interesting examples from real life will also be discussed.
We'll consider common mistakes in Architecture of Oracle Databases, Servers and Storages and ways of resolving this.

Troubleshooting of Standalone Databases

In this part we'll discuss the pros and cons of usual techniques of troubleshooting on the example from real life. Some improvements of these techniques will be offered at the end of the part. The list of used tools is: AWR/Statspack, Healthcheck v.1 (text HTML version), Healthcheck v.2(chart HTML version), OS tools (top, vmstat, etc).
The main goal of troubleshooting is to find a bottleneck and find the reason of bottleneck. We can call bottleneck both OS resource issue (CPU, IO, Memory, Network) and database resource issues (locks, latches, slow SQL, memory issues, etc).
We have two problems with standard set of tools inside db: you can't see enough information for all AWR snapshots in one report, and you can't see needed information in charts.
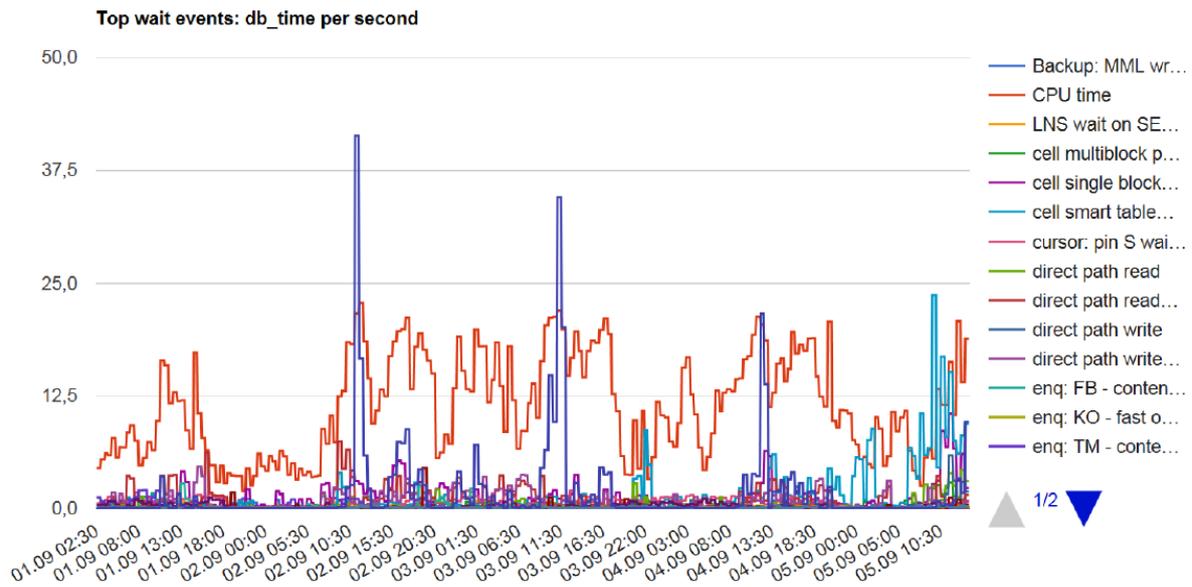At this presentation we will see how to resolve both problems.

Illustration. 1: Troubleshooting of Standalone Database by Top Wait Event

Troubleshooting of RAC databases

At this part we'll discuss the architecture of Real Application Cluster and the differences in troubleshooting of RAC. Two examples from real life will show the most significant issues.

	Per Second	Per Transaction
Global Cache blocks received:	1,639.34	3.46
Global Cache blocks served:	1,647.82	3.48
GCS/GES messages received:	3,041.26	6.42
GCS/GES messages sent:	3,022.87	6.38
DBWR Fusion writes:	176.10	0.37
Estd Interconnect traffic (KB)	27,481.61	

Illustration. 2: Troubleshooting of RAC by AWR

Troubleshooting of databases on Exadata

At this part an architecture of Exadata will be discussed. We'll discuss exadata specific issues with help of examples. Some issues from database consolidation projects will be discussed as well. Standard and alternative tools for troubleshooting will be observed.

```
'collectionTime'                    ,     'WORK',       'TEST',       'DEV'
'2016-02-06T07:00:14+01:00'         ,        44 ,          11 ,         21
'2016-02-06T07:01:14+01:00'         ,        36 ,          12 ,         22
'2016-02-06T07:03:14+01:00'         ,        16 ,          11 ,         23
'2016-02-06T07:04:14+01:00'         ,        44 ,          11 ,         24
'2016-02-06T07:05:14+01:00'         ,        63 ,          11 ,         25
'2016-02-06T07:06:15+01:00'         ,        55 ,          11 ,         26
'2016-02-06T07:07:15+01:00'         ,        43 ,          12 ,         26
'2016-02-06T07:08:15+01:00'         ,        32 ,          11 ,         23
'2016-02-06T07:09:15+01:00'         ,        35 ,          12 ,         22
'2016-02-06T07:10:15+01:00'         ,        26 ,          11 ,         21
'2016-02-06T07:11:15+01:00'         ,        27 ,          11 ,         22
'2016-02-06T07:12:15+01:00'         ,        18 ,          12 ,         23
'2016-02-06T07:13:15+01:00'         ,        75 ,          11 ,         24
'2016-02-06T07:14:15+01:00'         ,        63 ,          14 ,         25
'2016-02-06T07:15:15+01:00'         ,        52 ,          14 ,         26
'2016-02-06T07:16:15+01:00'         ,        41 ,          15 ,         23
```

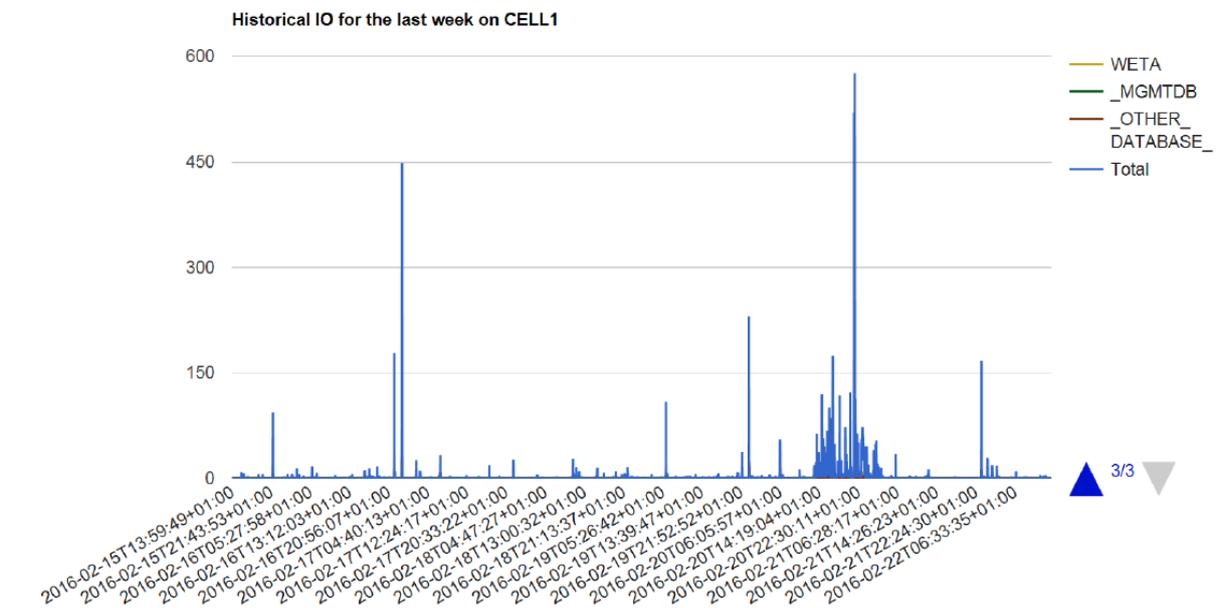*Illustration. 3: Troubleshooting of Exadata by CellCLI*

Illustration. 4: Troubleshooting of Exadata by charts from CellCLI

Common issues for all types of databases

At this part of presentation we will discuss the most common issues which DBA can meet. That will cover issues of server architecture (wrong storage, wrong network decisions, wrong usage of virtual machines, etc), issues of database architecture (wrong location of files. FK without indexes, wrong size of SGA/PGA, etc) and SQL issues (SQLs with literals, wrong parallel degree on query, etc)

Common issues for RAC databases

At this part of presentation we will discuss the most common issues which DBA can meet on RAC environment. These are: overloaded interconnect, wrong network for interconnect, different load on database nodes, backup from one node only, overloaded CPU, wrong types of database sequences, usage of ASM on external redundancy.

Common issues for databases on Exadata

At this part of presentation we will discuss the most common issues which DBA can meet on Exadata environment. They are: overload of CPU, network or IO in case of database consolidation project, wrong usage of cpu_count parameter, absence of RESOURCE_MANAGER_PLAN; huge quantity of sorts and multipath hash joins, absence of huge pages, wrong usage of USABLE_FILE_MB, wrong understanding of ASM redundancy.

Contact address:

Name	**Oleg Bezemchuk**
Company	Sysco AS
Address	Vollsveien 2A,
Postal code, city	1366 Lysaker, Norway

Phone:	+47 400 344 73
Fax:	+47 52 82 59 00
Email	oleg.bezemchuk@sysco.no
Internet:	bezemchuk@gmail.com