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Michigan Oracle User Summit

Proactively Find Potential Performance Problems by Mining
the AWR Repository

November 30, 2011

Wayne Sharp

Union Gas







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WHACK-A-MOLE



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Wayne Sharp
Union Gas

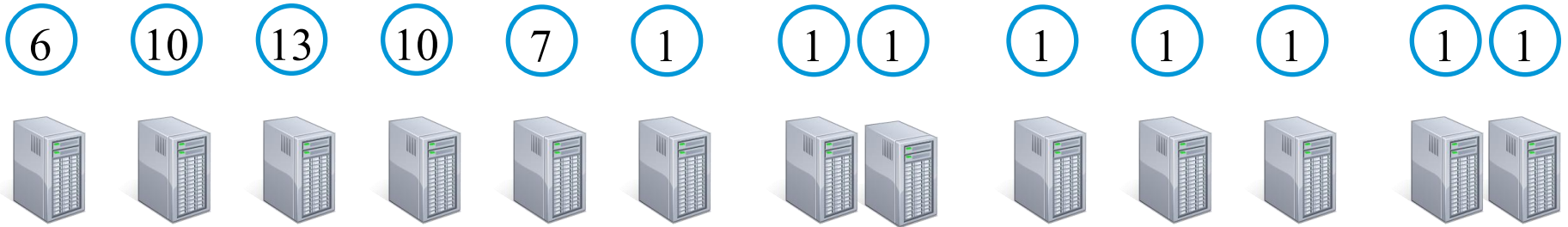




- Overview of Environment
- Problem Description
- Quick Look at DBA_HIST_* Views
- Walkthrough of Scripts Used
- Other Opportunities



- Intended Audience = DBAs
- Assume familiarity with AWR Reports
- Extra licensing is required for AWR, queries provided could violate your licensing terms if run
- Goal of this session is to show how to find things that need fixing, without showing how to fix (that could be several future sessions)
- Presentation and scripts will be available on website
- There will be time for questions at the end, but feel free to ask at any time



13 servers
54 instances



- 3 high profile production applications were experiencing severe performance degradation
- Response time for the other 49 applications was either:
 - Normal or
 - Degraded with users not reporting the degradation
- I/O latency appeared to be the culprit
- SAN administrator blamed I/O volume as the cause of the latency

- DBA Task – Identify the source of high I/O volume

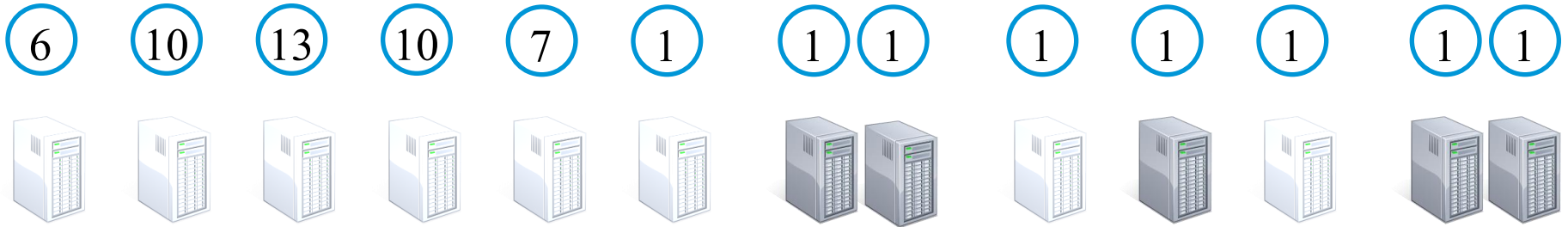
The Problem – Severe Degradation



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Run AWR reports for each of the 54 production instances

Load Profile

A

	Per Second	Per Transaction
Redo size:	55,597.86	16,982.94
Logical reads:	58,675.87	17,923.15
Block changes:	364.81	111.43
Physical reads:	107.21	32.75
Physical writes:	17.64	5.39
User calls:	401.28	122.57
Parses:	100.90	30.82
Hard parses:	0.74	0.23
Sorts:	48.29	14.75
Logons:	0.10	0.03
Executes:	173.76	53.08
Transactions:	3.27	

Top 5 Timed Events

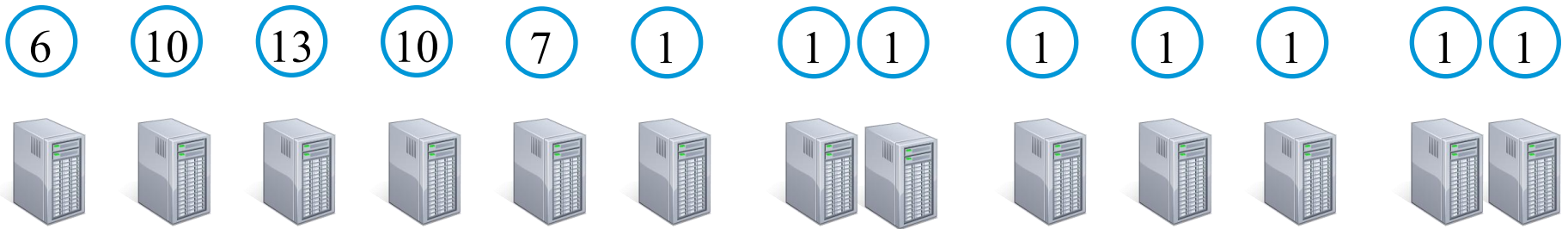
Event	Waits	Time(s)	Avg Wait(ms)	% Total Call Time	Wait Class
log file sync	835	265	317	95.9	Commit
control file sequential read	24,149	115	5	41.8	System I/O
log file parallel write	758	99	130	35.8	System I/O
db file sequential read	20,340	90	4	32.6	User I/O
CPU time		87		31.6	

Latency Analysis

- Collecting this data was manual and very time-consuming
- The picture provided was very valuable – for the interval covered
- It would be nice to have this same information for the other 167 hours of the week
- But not practical to gather this information using the same methods



THERE HAS TO BE A BETTER WAY!



13 servers
54 instances



- AWR Reports provide all the information needed
- AWR gets all its information from the catalog

→ start looking at the raw data in the catalog

- For this particular problem, we want to know I/O activity (physical reads and physical writes)

```
select distinct stat_id, stat_name from  
dba_hist_sysstat order by 2;
```

Stat IDs



```
desc dba_hist_sysstat
```

Name	Null?	Type
SNAP_ID		NUMBER
DBID		NUMBER
INSTANCE_NUMBER		NUMBER
STAT_ID		NUMBER
STAT_NAME		VARCHAR2 (64)
VALUE		NUMBER



```
desc dba_hist_snapshot
```

Name	Null?	Type
-----	-----	-----
SNAP_ID	NOT NULL	NUMBER
DBID	NOT NULL	NUMBER
INSTANCE_NUMBER	NOT NULL	NUMBER
STARTUP_TIME	NOT NULL	TIMESTAMP (3)
BEGIN_INTERVAL_TIME	NOT NULL	TIMESTAMP (3)
END_INTERVAL_TIME	NOT NULL	TIMESTAMP (3)
FLUSH_ELAPSED		INTERVAL DAY (5) TO SECOND (1)
SNAP_LEVEL		NUMBER
ERROR_COUNT		NUMBER

Script 1

START_DATE	READS	WRITES	TOTAL_IO
2011-11-11 18:00:57	478858	352161	831019
2011-11-11 19:00:19	478868	357713	836581
2011-11-11 20:00:34	478877	362315	841192
2011-11-11 21:00:53	479263	372692	851955
2011-11-11 22:00:09	479273	377908	857181
2011-11-11 23:00:30	479300	382486	861786
2011-11-12 00:00:49	479306	387807	867113
2011-11-12 01:00:59	479684	398192	877876
2011-11-12 02:00:15	479812	403138	882950
2011-11-12 03:00:30	480037	408034	888071
2011-11-12 04:00:43	482717	439127	921844
2011-11-12 05:00:08	483080	464365	947445

Introduce Lead Function



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Script 2

START_DATE	INTERVAL_READS	INTERVAL_WRITES	INTERVAL_DURATION
2011-11-11 18:00:57	10	5552	3562
2011-11-11 19:00:19	9	4602	3615
2011-11-11 20:00:34	386	10377	3619
2011-11-11 21:00:53	10	5216	3556
2011-11-11 22:00:09	27	4578	3621
2011-11-11 23:00:30	6	5321	3619
2011-11-12 00:00:49	378	10385	3610
2011-11-12 01:00:59	128	4946	3556
2011-11-12 02:00:15	225	4896	3615
2011-11-12 03:00:30	2680	31093	3613
2011-11-12 04:00:43	363	25238	3565
2011-11-12 05:00:08	334	10309	3616
2011-11-12 06:00:24	12	5326	3619



Script 3

START_DATE	READS_PER_SEC	WRITES_PER_SEC	IO_PER_SEC
-----	-----	-----	-----
2011-11-11 18:00:57	.002807412	1.5586749	1.56148231
2011-11-11 19:00:19	.002489627	1.27302905	1.27551867
2011-11-11 20:00:34	.106659298	2.86736668	2.97402597
2011-11-11 21:00:53	.002812148	1.46681665	1.4696288
2011-11-11 22:00:09	.007456504	1.26429163	1.27174814
2011-11-11 23:00:30	.001657917	1.47029566	1.47195358
2011-11-12 00:00:49	.104709141	2.8767313	2.98144044
2011-11-12 01:00:59	.035995501	1.39088864	1.42688414
2011-11-12 02:00:15	.062240664	1.35435685	1.41659751
2011-11-12 03:00:30	.741765846	8.6058677	9.34763355
2011-11-12 04:00:43	.101823282	7.07938289	7.18120617
2011-11-12 05:00:08	.092367257	2.85094027	2.94330752

Add Filter Criteria



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Script 4

START_DATE	READS_PER_SEC	WRITES_PER_SEC	IO_PER_SEC
-----	-----	-----	-----
2011-11-11 13:00:10	508.683402	7.72866941	516.412071
2011-11-14 08:00:20	570.417377	10.6796811	581.097058
2011-11-14 09:00:57	1481.44432	108.270529	1589.71485
2011-11-14 14:00:28	878.381123	28.8712163	907.252339
2011-11-15 08:00:52	3318.74067	232.493404	3551.23407
2011-11-15 09:00:15	3429.54658	192.271775	3621.81836
2011-11-15 13:00:59	478.132291	33.8205414	511.952833
2011-11-16 09:01:00	623.330437	13.6678812	636.998318
2011-11-16 15:00:42	739.951397	35.552514	775.503911
2011-11-17 08:00:12	4418.12709	231.605819	4649.73291
2011-11-17 09:00:55	1841.62892	117.141536	1958.77046
2011-11-17 10:00:23	3917.10168	241.604749	4158.70642
2011-11-17 11:00:03	4517.05957	262.904854	4779.96442
2011-11-17 13:01:00	570.992433	30.1258408	601.118274
2011-11-18 08:00:48	3328.39374	188.652405	3517.04614

Someone Get me a Mallet



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```
desc dbms_workload_repository
```

```
FUNCTION AWR_REPORT_HTML RETURNS AWRPT_HTML_TYPE_TABLE
```

Argument Name	Type	In/Out	Default?
L_DBID	NUMBER	IN	
L_INST_NUM	NUMBER	IN	
L_BID	NUMBER	IN	
L_EID	NUMBER	IN	
L_OPTIONS	NUMBER	IN	DEFAULT

All parameters required for this function are available in the Views we are querying.

Script 5

```
spool c:\moles\NOV-2011\dsmt\dsmt_NOV_16_0901.html
select output from table ( dbms_workload_repository.awr_report_html
  (1657418894, 1, 27884, 27885));
spool off
```

But There are 53 More DBs!



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- I'm fortunate enough to have a Database that stores SYSTEM passwords for all databases.
- Script to connect to all databases as SYSTEM and run the mole-finder script for each

[Mole Script](#)

[Find Moles](#)

[moles_2011_11_17.txt](#)



[moles 2011 11 29.html](#)

Average Workloads

Latency

Average I/O

CPU

Generate AWR

Questions



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Thank You

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