



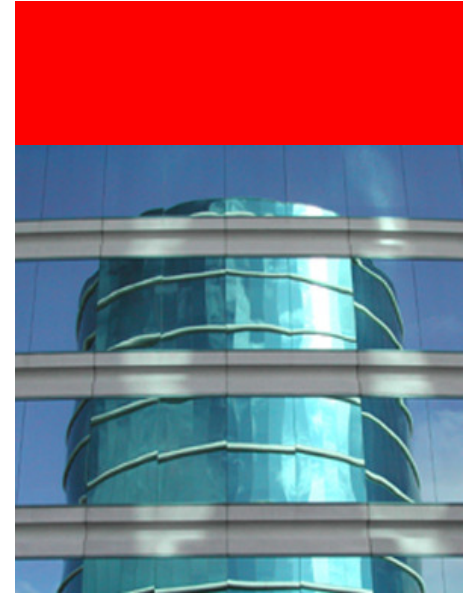
ORACLE®

OSW Black Box Analyzer

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OSW Black Box Analyzer Overview





OSW4.0 Black Box

- OSW release 4.0 has been renamed to OSWbb (Black Box) to avoid confusion with many tools also named OSW
- OSWg renamed to OSWbba (Black Box Analyzer)
- Packaged together in single tar file
- MOS has link to latest version (Note:**301137.1**)



OSW4.0 Black Box: What's new

- CPU count (from OS) and snapshot interval (from OSWbb) are reported in the vmstat log file
- If cpu count is known then metrics involving run queue can be adjusted and cpu performance problems on the system can be identified
- Snapshot interval used as baseline to automatically determine when system slows down



Why a Black Box?

- SR avoidance and reduced resolution time
- The amount and size of the log files collected by OSWbb can be overwhelming
- Not everyone skilled on reading and analyzing data from Unix performance utilities
- Black box analyzes files automatically
- Provides instantaneous analysis of OSWbb files
- Ignores “noise”
- Focus on finding most significant problem
- Ascii output file, easy upload to SR



OSW Black Box Analyzer: Overview

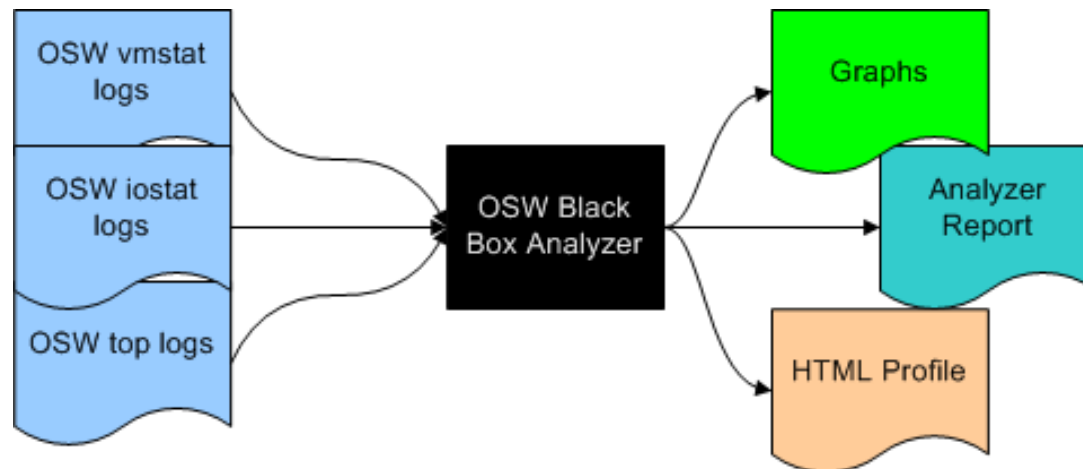
- Java executable oswbba.jar
- Packaged with OSWbb
- Runs on Unix, Linux and Windows platforms
- Automatically analyzes OSWbb log files
- Provides graphs, html profile report and textual analysis report which can be easily uploaded to SR



OSW Black Box Analyzer: Components

- Graphing Memory, CPU, Disk (options 1:8)
- HTML Profile (option P)
- Analyzer (option A)

OSW Black Box Analyzer





OSW Black Box Analyzer

- Produces text report of analysis of OSWbb log files
- Analyzes vmstat, iostat and top log files
- Currently does not analyze net and exadata logs (next release)
- Analysis broken down into sections for easy readability
- Only identifies real problem. Ignores noise.
- Will attempt RCA at process level if possible
- Provides recommendations and what to look for if problem is identified



OSW Black Box Analyzer: How to Install

- No installation required
- oswbba shipped with OSWbb
- oswbba executable in same directory where OSWbb was installed



OSW Black Box Analyzer: How to run

- Run the menu interface and select option A

Usage :

```
java -jar oswbba.jar -i <fully qualified path of OSWbb archive dir>
```

- Run from the command line

Usage :

```
java -jar oswbba.jar -i <fully qualified path of OSWbb archive dir> -A
```



OSW Black Box Analyzer: Output

- The output report is in the analysis directory where OSWbb was installed
- Files are named analysisxxxxxx.log



OSW Black Box Analyzer: Report format

- Analyzer output divided into the sections for easy readability

Section 1: Overall Status

Section 2: System Slowdown Summary Ordered By Impact

Section 3: Other General Findings

Section 4: CPU Detailed Findings

Section 5: Memory Detailed Findings

Section 6: Disk Detailed Findings

- These sections are explained in the following slides



Section 1: Overall Status

- Quick heads up status of each major subsystem
 - Currently status of CPU, Memory and I/O subsystems
 - Next release will include Net and Exadata
 - Status values are
 - OK No problem detected
 - Warning Attention is required
 - Critical Attention is critical
 - Unknown Status could not be determined
- ✓ Missing metrics. Not all OS versions contain necessary metric. Memory scan rate is an example
 - ✓ HP-UX iostat does not support extended disk statistics
 - ✓ AIX does not use top (topas not controllable in Unix shell)



Section 1: Overall Status

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Subsystem	Status

CPU	CRITICAL
MEMORY	WARNING
I/O	OK



Section 2: System Slowdown Summary Ordered By Impact

- OSWbb contains heartbeat timestamps in log files
- Heartbeats that do not happen at expected intervals indicate OS is slowing down or experiencing hangs
- The following columns are identified in this section
 - Snaptime -timestamp when slowdown occurred
 - Variance – the amount of difference between the expected heartbeat time and the actual heartbeat time
 - Secs – the time in seconds between heartbeats
 - Flags – bitmapped indicators for cpu, memory and io problems
 - Cause – most likely cause of slowdown identified

Section 2: System Slowdown Summary Ordered By Impact

Section 2: System Slowdown RCA Ordered By Impact

SnapTime	Variance	Secs	Flags	Cause(Most Likely)
Fri May 27 22:36:04	1.1	34	0002-00-00	1: Root Processes High CPU 2: System low on Memory

Slowdown time and duration

First the analyzer identifies slowdown and most likely causes

>>>Cause 1: Root Processes High CPU

Checking top processes...

SnapTime	Pid	CPU	Command
Fri May 27 22:36:04 GMT 2011	797	74.6	[kswapd0]

Next the analyzer identifies offending process

Advise:

Check the process listed above.

Advice on what to do

Reasons:

1. The system is under stress with respect to system resources
2. The system is low on memory

Identifies most likely reasons



Section 3: Other General Findings

Any additional findings will be listed in this section

Section 3: Other General Findings:

CRITICAL: CPU Run Queue observed very high spikes.

CRITICAL: Memory severe swapping observed.



Section 4: CPU Detailed Findings

- Provides summary of cpu metrics collected in the archive
- The following metrics are reported:
 - CPU Run Queue
 - CPU Utilization
 - Root processes > 50%
 - Oracle Background processes > 50%
 - CPU Percent System

Section 4: CPU Detailed Findings

CPU Detailed Findings:

CPU RUN QUEUE: NUMBER PERCENT

Snaps captured in archive	14413	100.00
High (>3)	41	0.28
Very High (>6)	6	0.04
High spanning multiple snaps	0	0

There were 14413 snapshots contained in the osw archive

Of these 14413 snapshots, 41 snapshots had high run queue

Of these 14413 snapshots, 6 snapshots had very high run queue

Of these 14413 snapshots, 0 snapshots spanned more than 1 snap

The following snaps recorded very high run queues:

SnapTime Value Value/#CPU

Thu May 26 00:43:57 GMT 2011	12	6
Thu May 26 01:42:00 GMT 2011	15	7
Thu May 26 08:40:12 GMT 2011	17	8
Thu May 26 20:40:34 GMT 2011	18	9
Sat May 28 00:41:34 GMT 2011	13	6
Sat May 28 00:44:05 GMT 2011	12	6

Times where run queue was reported high

Run queue value

The effective run queue: Run Queue/# CPU

Section 4: CPU Detailed Findings

CPU UTILIZATION: PERCENT SYS

	NUMBER	PERCENT

Snapshots captured in archive	14413	100.00
High (>30%)	0	0
Very High (50%)	0	0
High spanning multiple snaps	0	0

CPU UTILIZATION: The following snaps recorded ROOT processes using high percent cpu:

SnapTime	Pid	CPU	Command

Tue May 24 19:12:24 GMT 2011	13982	70.5	/usr/bin/python
Fri May 27 06:12:24 GMT 2011	30597	62.6	/usr/bin/python
Fri May 27 22:36:04 GMT 2011	797	54.6	[kswapd0]

Root processes consuming high CPU
are quickly identified

CPU UTILIZATION: The following snaps recorded ORACLE Background processes using high percent cpu:

SnapTime	Pid	CPU	Command

Wed May 25 00:16:37 GMT 2011	13035	54.0	ora_dbw0_PRODA1
Thu May 26 00:15:56 GMT 2011	13035	56.4	ora_dbw0_PRODA1
Thu May 26 00:40:27 GMT 2011	13035	57.6	ora_dbw0_PRODA1
Sat May 28 05:40:49 GMT 2011	12975	58.2	ora_lms1_PRODA1
Sat May 28 05:40:49 GMT 2011	12961	57.5	ora_lms0_PRODA1

Oracle background processes consuming
high CPU are quickly identified



Section 5: Memory Detailed Findings

- Provides summary of memory metrics collected in the OSWbb archive
- The following metrics are reported for those OS's that report these metrics in vmstat
 - CPU Process Queue
 - Memory Scan Rate
- If these metrics are not available then memory status will be UNKNOWN in Section 1.

Section 5: Memory Detailed Findings

Memory Detailed Findings:

MEMORY: PROCESS SWAP QUEUE

	NUMBER	PERCENT

Snapshots captured in archive	232	100.00
High (>0%)	0	0
High spanning multiple snaps	0	0

Scan Rate is the most important indicator for memory issues

MEMORY: SCAN RATE

	NUMBER	PERCENT

Snapshots captured in archive	232	100.00
High (>0)	3	1.29
Very High (>200)	3	1.29
High spanning multiple snaps	2	0.86

Scan rate that is high and spans multiple snapshots is indicator free memory was low

The following snapshots recorded very high scan rates:

SnapTime	Value

Tue Aug 31 11:00:33 GMT 2010	200
Tue Aug 31 11:00:48 GMT 2010	300
Tue Aug 31 11:01:03 GMT 2010	550

The snapshot times scan rate was high are listed



Section 6: Disk Detailed Findings

- There may be hundreds of devices on a system
- Analyzer looks only at those devices which may be problematic, ignoring all others
- Only devices that are busy more than 50% are reported
- Storage arrays have cache which skew metrics being reported
- Throughput is only reliable metric for storage arrays
- For debugging storage arrays a throughput analysis of those devices are listed in the report



Section 6: Disk Detailed Findings

- Provides summary of device metrics collected in the archive
- The following metrics are reported
 - Device Percent Busy for devices with percent busy > 50%
 - Device Service Time for devices with service time > 10 msec
 - Device Throughput for devices with percent busy > 50%

Section 6: Disk Detailed Findings

Section 6: Disk Detailed Findings

Section 6.1: Device Percent Busy Findings:

(Only Devices With Percent Busy > 50% Reported:)

Only devices with percent busy > 50% listed

DEVICE: hdisk0 PERCENT BUSY
NUMBER PERCENT

Snaps captured in archive	111	100.00
High (>50%)	111	100.00
Very High (>95%)	0	0
High spanning multiple snaps	110	90.91

Notice this device is always busy and
requires further investigation

#####

Section 6.2: Device Service Times Findings:

(Only Devices With Average Service Time > 10msec Reported:)

No devices listed because no devices
had service time > 10msec

No devices with service time > 10 msec found

Section 6: Disk Detailed Findings

Section 6.3: Device Throughput Findings:
(Only Devices With Percent Busy > 50% Reported:)

Throughput shows busier the device gets
the lower the throughput

DEVICE: hbb00

%BUSY	NUMBER	MIN_KR/S	MAX_KR/S	AVG_KR/S	MIN_KW/S	MAX_KW/S	AVG_KW/S
50-59	0	0.0	0.0	0.0	0.0	0.0	0.0
60-69	90	0.0	330.0	36.7	0.0	0.0	0.0
70-79	200	0.0	460.0	48.0	0.0	0.0	0.0
80-89	16	0.0	356.0	37.0	0.0	0.0	0.0
90-99	22	0.0	201.0	29.0	0.0	0.0	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0

- Metrics can look good coming back for storage arrays but throughput can identify problem
- In this example percent busy looked ok. Throughput on the storage array showed something different



Feedback or Questions?

- Email me, Carl.Davis@Oracle.com