

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

Alerts, Alarms, Pages and Harbingers of Trouble...

Key Performance Indicators and Tools to Measure them with.

Progress Exchange 2008  
OPS-8

DBAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 1

This slide features a black silhouette of a bird in flight in the top right corner. The text is centered and uses a mix of blue and orange colors. Logos for DBAppraise and Progress Exchange are visible at the bottom.

---

---

---

---

---

---

---

---

A Few Words About The Speaker

- Tom Bascom
- Progress® User since 1987
- White Star Software, LLC
- DBAppraise, LLC
- Consulting Services related to Progress Databases and Application Architecture.

tom@wss.com  
tom@dbappraise.com

DBAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 2

This slide includes an orange checkmark icon in the top right. The content is a bulleted list of the speaker's background and contact information. Logos for DBAppraise and Progress Exchange are at the bottom.

---

---

---

---

---

---

---

---

Agenda

- Alerting Basics
- Key Performance Indicators
- Tools
  - Progress Oriented
  - OS and Hardware Specific
  - Application Monitoring
- Conclusion

DBAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 3

This slide features an orange checkmark icon in the top right. The agenda items are listed in a hierarchical structure. Logos for DBAppraise and Progress Exchange are at the bottom.

---

---

---

---

---

---

---



---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

## Nomenclature

- Alerts – Something Interesting Happened (or didn't happen).
- Alarms – You should take a look at this.
- Pages – Immediate Action Required!
- Harbingers – Worrisome trends...

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 4 

---

---

---

---

---



---

---

---

## Avoiding "Alert Fatigue"

- Vary thresholds with the work-load
  - Business hours, batch processing, maintenance windows, weekends.
- Don't nag excessively
  - Decide which alerts deserve continuous, hourly, daily, weekly repetition
- Make sure that alerts are **relevant**.
- Check for the absence of positives as well as the presence of negatives

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 5 

---

---

---

---

---



---

---

---

## Collect a Baseline

- You can establish **any** trend with one data point.
- In order to see the forest...
- ... you have to plant some trees.
  
- How many of you currently routinely collect performance data?
- How often?
- What metrics do you collect?

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 6 

---

---

---

---

---

---

---

---

## OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

### Tom Bascom

### Consider Multiple Baselines

- Business Hours
- Batch Cycles
- Weekends and Holidays
- Seasonal Variations

- Do you support a business with multiple workloads?

OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble
7

---

---

---

---

---

---

---

---

### First Establish a Baseline

	Min	Avg	Max	Std Dev
1 LogRd	16,574	138,112	523,210	87,887.31
2 OSRd	84	1,267	7,762	957.66
5 Trx	3	118	1,859	158.68
6 LatchTMO	0	12	249	23.31
7 ResrcWt	0	23	767	74.54
13 Con_TRX	29	104	156	19.16
14 Con_Block	0	1	48	2.72
15 Con_Total	213	745	903	116.06
17 OldTRX	2	14	42	4.42
23 ai_full	0	1	7	0.88
28 LogWr	14	399	5,151	340.49
29 OSWr	2	31	199	17.38
30 RecCr	1	26	332	25.68
31 RecRd	6,154	56,384	252,751	41,327.96
34 RecLk	19	1,388	35,304	2,285.87

OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble
8

---

---

---

---

---

---

---

---

### Chart Your Baseline

OPS-4

---

---

---

---

---

---

---

---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

## Tom Bascom

**Agenda**

- Alerting Basics
- Key Performance Indicators**
- Tools
  - Progress Oriented
  - OS and Hardware Specific
  - Application Monitoring
- Conclusion

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 10

---

---

---

---

---

---

---

---

**Key Performance Indicators**  
**Progress Database**

- “Logical Reads” – aka “db accesses”
- Commits per second
  
- Blocked Sessions
- Long Active Transactions
- Buffers Flushed
- Resource Waits
- Latch Waits

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 11

---

---

---

---

---

---

---

---

**Key Performance Indicators**  
**Progress Sessions**

- Sort file usage (-T, -t, srt\*)
  - Client side sorting, forward-only attribute
  - R-Code swapping, use -y and grep for “Writes to”
- Temp table overflows (-T, -t, DBI\*)
  - Minimum DBI size varies but is stable
  - File size is the only diagnostic
- LBI file usage (-T, -t, lbi\*)
  - Undo variables in loops
  - File size is the only diagnostic
- Runaways and orphans

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 12

---

---

---

---

---

---

---



---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

### Key Performance Indicators Operating System

- Disk Busy
- Disk IO Ops
- CPU Idle Time
- CPU usr% vs sys%
- Program Memory Page-Outs
- Context Switching
- Network errors
- Ping times

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 13 

---

---

---

---

---



---

---

---

### Application Performance Indicators

- Try to establish some “bridge” metrics
  - Meaningful to the business.
  - Non-technical measurements.
  - Indicative of business activity that drives system activity.
  - Easily measured – such as integer counters or summaries of accounts.
- Orders, order-lines, shipments, sales volume...
- Report run times.

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 14 

---

---

---

---

---



---

---

---

### Bogus Performance Indicators

- Disk Full
- Hit Ratio
- Uptime/Load Average
- Swap used
- Idle users
- %WIO

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 15 

---

---

---

---


---

---


---

---

**The Ultimate KPI is  
The User Experience**



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 16



---

---

---

---


---

---


---

---


**Agenda**



Alerting Basics  
Key Performance Indicators  
**Tools**  
    Progress Oriented  
    OS and Hardware Specific  
    Application Monitoring  
Conclusion



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 17



---

---

---

---


---

---


---

---


**What sorts of tools do we  
need?**



- Static Analysis
- Interactive Monitors
- Background Data Collection and Monitoring
- Data Consolidation and Presentation
- **The emphasis in this presentation is on freely available tools.**



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 18



---

---

---

---

---

---

---

---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

**Agenda**

- Alerting Basics
- Key Performance Indicators
- Tools
  - Progress Oriented**
  - OS and Hardware Specific
  - Application Monitoring
- Conclusion

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 19

---

---

---

---

---


---

---

---

**Finding Trouble...  
Before Trouble Finds You!**

- PROMON
- VSTs
- Proutil
- Meta-Schema
- DB Log Files
- OS Specific Utilities
- Application Specific Instrumentation



DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 20

---

---

---

---

---

---

---

---

**PROMON**

- Summary
  - R&D -> 2 -> 1
- Performance Indicators
  - R&D -> 3 -> 1
- IO Operations by Process
  - R&D -> 3 -> 2

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 21

---

---

---

---

---

---

---

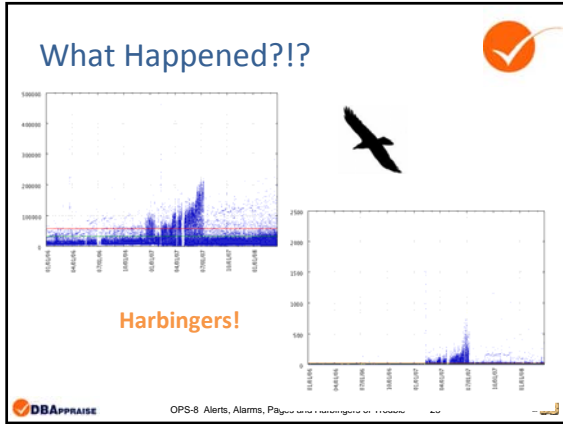
---





# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom



---

---

---

---

---

---

---

---

- ### Proutil
- TAB/IDX/DB Analys
    - Size
    - Scatter
    - Fragmentation
    - Index Utilization
  - Matching of RPB to Row Size
  - Matching of Cluster Size to Data Size
- DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 26

---

---

---

---

---

---

---

---

- ### Meta-Schema
- chkarea.p
  - areatrend.p
  - Table analysis...
  - Record size distribution
  - idxoverlap.p
  - Index break analysis
- DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 27

---

---

---

---

---

---

---

---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

## Tom Bascom

### chkarea.p

Storage Areas violating capacity threshold (80%):

Area Name	%Alloc	Suggest
APP_COMMENT_Dat	97%	7,744,576
APP_COMMENT_idx	149%	1,340,160
APP_INQ_Dat	103%	5,174,160
APP_INQ_idx	350%	2,453,040

**Alert!**

#	Area Name	Allocated	Var	Total	KB Used	%Alloc	%Max	Blocks	RFB	CSZ
3	Primary Recovery	10,240,000	0	10,239,920	4,718,592	46%	2,048	0.02%	1	1
6	Schema Area	128,000	0	128,112	2,968	2%	32	0.00%	64	1
100	APP_TRANSTAGG_dat	20,480,000	0	20,484,008	6,025,264	29%	8	8.97%	256	512
101	APP_TRANSTAGG_idx	10,240,000	0	10,240,080	1,524,272	15%	2,048	0.00%	1	8
102	APP_TRADE_dat	12,288,000	0	12,292,040	7,852,080	64%	32	2.92%	64	512
103	APP_TRADE_idx	4,096,000	0	4,096,104	887,344	22%	2,048	0.00%	1	8
104	APP_RATE_DTL_dat	12,288,000	0	12,292,040	7,348,272	60%	16	5.47%	128	512
105	APP_RATE_DTL_idx	4,096,000	0	4,096,104	573,360	14%	2,048	0.00%	1	8
106	APP_DECRULE_dat	8,192,000	0	8,196,056	4,325,424	53%	16	3.22%	128	512
107	APP_DECRULE_idx	4,096,000	0	4,096,104	512,624	13%	2,048	0.00%	1	8
108	APP_INFO_dat	6,144,000	0	6,148,064	4,087,376	66%	64	0.75%	32	512
109	APP_INFO_idx	4,096,000	0	4,096,104	1,819,568	44%	2,048	0.01%	1	8

DBAPPRaise OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 28

### areatrend.p

Logs Evaluated:

```
/rd/logs/vstmon/chkarea.03.24
/rd/logs/vstmon/chkarea.03.17
/rd/logs/vstmon/chkarea.02.11
/rd/logs/vstmon/chkarea.02.04
```

	Current	Average	Worst
Total:	66.81	71.84	112.97 MB/day
Total:	1.96	2.10	3.31 GB/mth

**Harbingers!**

Num	Area Name	Allocated	Used	Alloc	Used	Current	Average	Worst	Proj
				MB/day	GB/mth	MB/day	GB/mth	MB/day	GB/mth
15	misc8_idx	64,000	51,464	80%	.00	.00	.07	.00	.29
161	zvwipgd_idx	128	72	56%	.00	.00	.00	.00	.00
17	misc16_idx	1,024,000	867,520	85%	1.21	.04	.98	.03	1.33
131	gleb_idx	128,000	107,936	84%	.11	.00	.09	.00	.16
18	misc32_dat	12,288,000	10,589,264	86%	1.90	.06	4.91	.14	11.50
101	one1_idx	4,096,000	3,181,104	78%	1.55	.05	2.49	.07	5.10
20	misc64_dat	8,192,000	5,853,856	71%	1.16	.03	3.43	.10	12.07
127	icaw_idx	256,000	180,440	70%	.05	.00	.10	.00	.37
21	misc64_idx	3,072,000	1,309,944	43%	.35	.01	1.00	.03	6.45
16	misc16_dat	6,144,000	4,637,760	75%	2.67	.08	2.38	.07	4.62

DBAPPRaise OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 29

### tba.p

Table Name	Size	Account	Records	Account	Reads	Account	Updates	Account	AvgRec	RFB	Scat	Frag	Ord
APP_TRANSTAGG	10737418040	17.43%	28672139	35.04%	9520441	1.02%	0	0.00%	37.20	256	1.50	0.00%	0
APP_TRADE	7301444401	29.28%	34437388	39.22%	18270495	2.97%	209239	4.10%	212.02	64	1.60	0.00%	0
APP_RATE_DTL	8768573893	40.26%	86467616	51.17%	56	2.97%	171142	30.99%	68.75	128	1.20	0.00%	0
APP_DECRULE	4509715661	47.58%	46122874	56.77%	4338145	1.44%	992142	50.45%	97.78	128	4.80	0.00%	0
APP_INQ	3788095984	53.68%	10951401	58.10%	309056703	36.50%	299214	56.21%	341.16	32	4.30	1.00%	0
APP_COMMENT	3328599654	59.09%	27054497	61.38%	2151503	36.73%	104605	58.36%	123.03	64	3.90	0.24%	0
APP_VARIANCE	2362232012	62.92%	31887977	65.25%	1583872	36.90%	414432	66.49%	74.08	128	5.10	0.39%	0
APP_TRANSHIST	2254857816	66.58%	48705188	71.17%	302901	36.93%	0	66.49%	46.25	256	1.20	0.00%	0
APP_INQ	2147483648	70.07%	26628560	74.40%	3303611	37.29%	153188	69.49%	80.64	128	1.00	0.00%	0
APP_ACTION	1932352693	73.20%	26420088	77.61%	8880789	37.38%	33913	70.16%	73.13	128	1.10	0.00%	0
APP_TRANSACT	1288490189	75.30%	3843032	78.08%	637432	37.45%	51460	71.16%	335.28	32	1.10	0.00%	0
APP_INCOIN	1288490189	77.29%	31314117	81.08%	112107	37.46%	51	71.17%	41.18	256	1.10	0.00%	0
APP_PFR	1181118069	79.30%	12336964	82.03%	302181	37.49%	5314	71.17%	958.85	16	2.80	0.03%	0
APP_OPTICH	524181142	80.15%	11991687	83.48%	1325247	38.91%	86572	72.97%	43.71	256	1.10	0.00%	0
CHART_ENTRY	118488909	80.17%	103528	83.50%	1057876	40.18%	0	72.97%	114.45	128	1.00	0.00%	0
HURRAL_CURE	176230	80.17%	1162	83.50%	23053864	66.84%	35583	73.66%	151.66	64	1.00	0.00%	0
SCORE_LEADHGT	40755	80.17%	483	83.50%	2394836	69.43%	0	73.66%	84.73	128	4.00	0.00%	0
CHART_SEGMENT	15565	80.17%	151	83.50%	2784260	73.94%	0	73.66%	103.08	128	1.00	0.00%	0
HURRAL_MEMB	14439	80.17%	443	83.50%	36646794	77.86%	0	73.66%	32.59	256	3.20	0.00%	0
RFE_CURE	12595	80.17%	355	83.50%	2478460	80.51%	19348	74.04%	35.49	256	3.70	0.00%	0
APP_COST	4301	80.17%	60	83.50%	2702249	81.40%	0	74.04%	71.68	128	1.00	0.00%	0
APP_HURRER	558261862	81.09%	200799	83.74%	450601	84.63%	41982	76.15%	279.02	32	1.10	0.00%	32
APP_SUMMARY	552914125	81.99%	1501727	83.92%	1574839	84.80%	90060	77.91%	368.19	32	1.10	0.00%	32
APP_PRICEING	551333001	82.81%	188886	84.15%	162427	84.80%	80485	79.16%	263.55	32	1.10	0.00%	32
APP_RESPD	466434408	83.60%	1418257	84.33%	4893753	85.33%	7339	79.64%	345.98	32	1.60	0.38%	32
APP_COLLAT	436207616	84.30%	1417042	84.50%	1571147	85.50%	26970	80.17%	307.83	32	3.60	0.88%	32
APP_VDR	41617814	84.98%	1418257	84.67%	38616	85.50%	17133	80.50%	251.45	32	3.90	0.99%	32
BRNDR	440019	84.99%	16398	84.67%	649368	86.19%	73	80.50%	268.57	32	4.10	1.26%	32
BP_DOC	82112	84.99%	207	84.67%	2411825	86.45%	0	80.50%	396.74	32	1.00	0.00%	32

**Harbingers!**

DBAPPRaise OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 30



# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

## Tom Bascom

### Immediately Interesting

- That's a long list ;-)
- Luckily we can put it in a file:

```
error.filter:  
(5408)  
(5175)  
(1166)  
(1124)  
(794)  
  
$ grep -f error.filter dbname.lg > error.log  
$ grep -v -f error.filter dbname.lg > shorter.log
```

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 34

---

---

---

---

---

---

---

---

### Generally Ignore

- Login/logout/userid
- Windows event viewer problems
- Soft parameters being increased

```
ignore.filter:  
(451)  
(334)  
(708)  
EDT  
vv_flush  
^$  
  
$ grep -v -f ignore.filter dbname.lg > interesting.log  
- or -  
$ grep -v -f ignore.filter shorter.lg > interesting.log
```

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 35

---

---

---

---

---

---

---

---

### Shouldn't be Missing

- Successful backup
- AI extent switches
- Successful AI roll forward (if we're looking at a warm spare)

```
#!/bin/sh  
for MSG in `cat ${1}`  
do  
  if ! grep "${MSG}" ${2} > /dev/null 2>1  
  then  
    echo "${MSG} is missing!"  
  fi  
done
```

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 36

---

---

---

---

---

---

---



---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

### That's Odd...

- Shouldn't these all be on one of the other lists? ;-)
- Don't get lazy – after reviewing items that are left over decide what to do with them.
- Leaving them on the “interesting” list will drive “alert fatigue”.

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 37 

---

---

---

---

---



---

---

---

### Other Log Files

- AppServer™ Logs
- Explorer Logs
- OS Logs
  - /var/log
  - /usr/adm
  - ...

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 38 

---

---

---

---

---



---

---

---

### Agenda

- Alerting Basics
- Key Performance Indicators
- Tools
  - Progress Oriented
  - OS and Hardware Specific**
  - Application Monitoring
- Conclusion

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 39 

---

---

---

---

---

---

---



---

# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

## OS & HW Specific Tools

- SAR
- VMSTAT
- IOSTAT
- NETSTAT
- PS
- NMON (AIX, Linux)
- TOP (Unix)
- SVMON (AIX)
- GLANCE (HPUX) (not free)
- TOPAS (AIX)
- PERFMON
- SysInternals
- NT Resource Kit
- Symm Manager (EMC)

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 40 

---

---

---

---

---

---

---

---



## SAR

- Standard cron setup (man sa1):  

```
0 8-17 * * 1-5 /usr/lib/sa/sa1 1200 3 &
```
- Better:  

```
0 * * * * /usr/lib/sa/sa1 300 12 &
```
- To analyze a historical period:  

```
$ export SADIR=/var/log/sa  
$ export DT=`date +%d`  
$ sar -f ${SADIR}/sa${DT} -i 300 -s 6:00 -e 18:00 -u
```

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 41 

---

---

---

---

---



---

---

---

## SAR – Highlights

- CPU Utilization `-u`  
– %usr, %sys, %wio, %idle
- System Calls `-c`  
– exec, fork, sread, swrit, rchar, wchar and scall
- Disk Activity `-d`  
– Per “disk”  
– %busy, avque, read, write, blks, avwait, avserv
- Process Switching `-w`  
– pswch/sec

 OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 42 

---

---

---

---

---

---

---

---




# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

## Agenda

- Alerting Basics
- Key Performance Indicators
- Tools
  - Progress Oriented
  - OS and Hardware Specific
  - Application Monitoring**
- Conclusion



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 46

---

---

---

---

---


---

---

---

## Application Specific Monitoring

- Read Response Time
- Transaction Response Time
- Report Run Times
- Numbers of Things Produced
- Revenue Generated



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 47

---

---

---

---

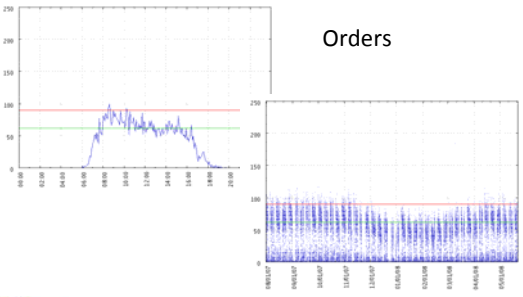
---

---


---

---

## Application Specific Monitoring



Orders



OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 48

---

---

---

---

---

---


---

---



# OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble

Tom Bascom

**Agenda** 

- Alerting Basics
- Key Performance Indicators
- Tools
  - Progress Oriented
  - OS and Hardware Specific
  - Application Monitoring
- Conclusion

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 49

---

---

---


---

---

---

---

---

**Monitor the Monitors** 

*Quis custodiet ipsos custodes?*

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 50

---

---

---

---

---

---

---

---

**Take-Aways and Resources** 

- A Baseline has value...
- There are “best practices” to follow...
- There are many, many tools out there...
- Downloads of Progress Tools:
  - <http://dbappraise.com>
  - [tom@wss.com](mailto:tom@wss.com)
  - [tom@dbappraise.com](mailto:tom@dbappraise.com)

DBAAPPRAISE OPS-8 Alerts, Alarms, Pages and Harbingers of Trouble 51

---

---

---

---

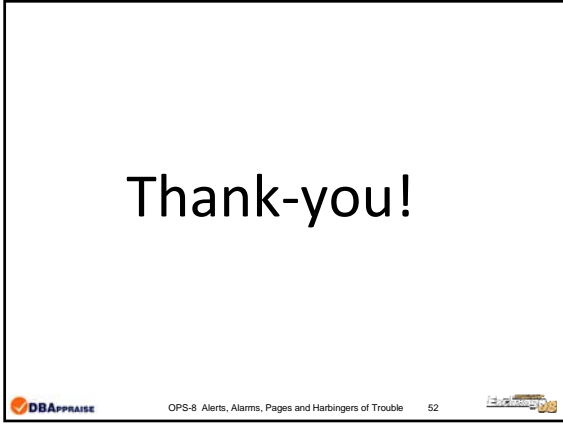
---

---

---

---

**OPS-8: Alerts, Alarms, Pages and Harbingers of Trouble**  
**Tom Bascom**



---

---

---

---

---

---

---

---