Oracle Database Monitoring for the Beginner

Chris Grabowy

cgrabowy@fcg.com

First Consulting Group

What is Database Monitoring?

The monitoring of predefined events that generates a message or warning when a certain threshold has been exceeded. This is done in an effort to ensure that an issue does not become a problem.

Is Database Monitoring Important?

There are many facets to database administration, the one that seems to get the least attention is database monitoring.
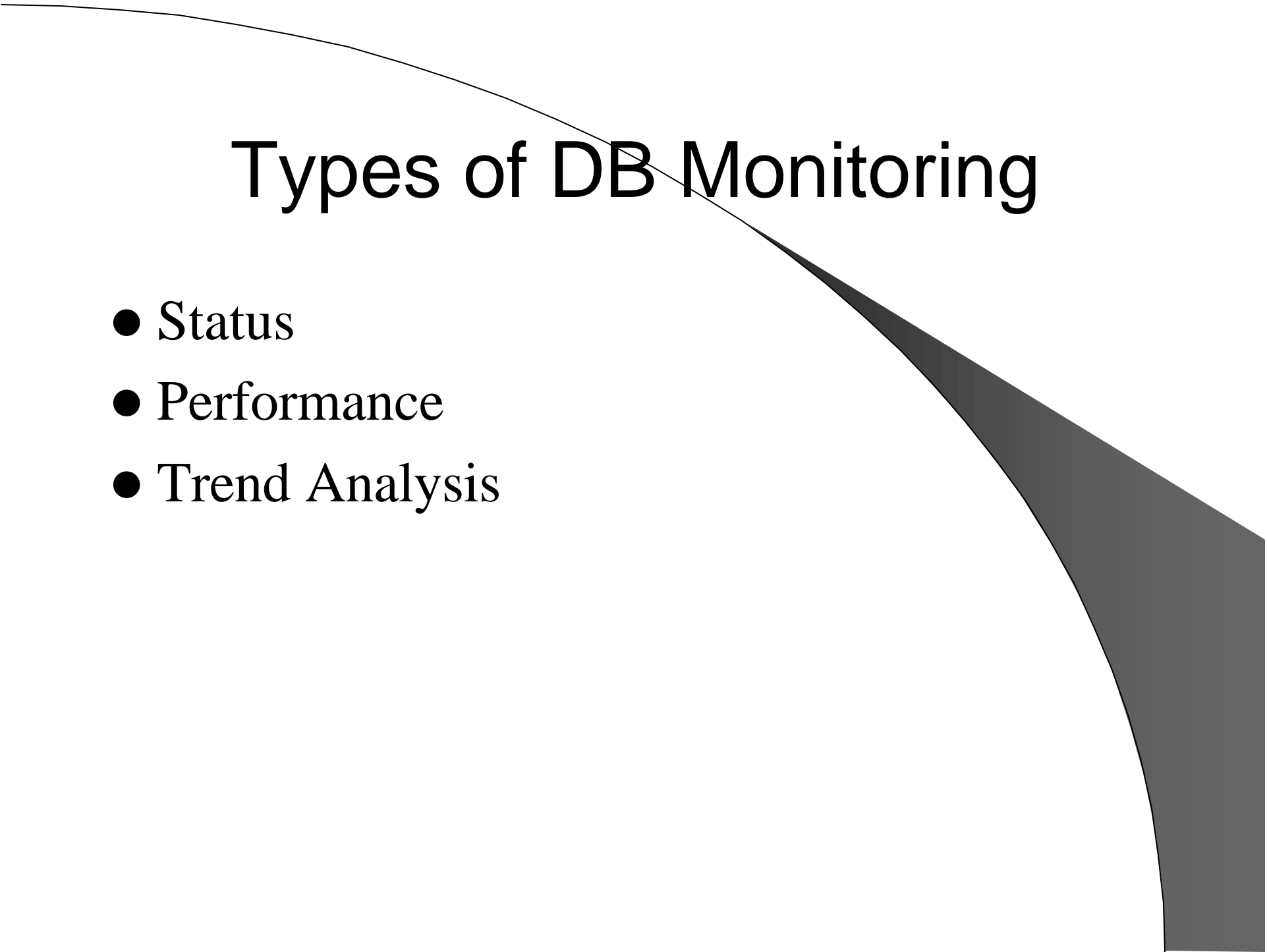
DBA TO-DO LIST

1) Performance Tuning
2) Backup/Recovery
…

…
98) Monitoring the database
99) Supporting developers

How many DBAs monitor?

- How many DBAs monitor their databases?
- Of those, how many use 3rd party products?

Why Monitor a Database?

- Supporting production!!!
- Keeping an eye on development, i.e. disabled FKs, PKs.
- In support of an SLA (service level agreement).
- Database performance.

Types of DB Monitoring

- Status
- Performance
- Trend Analysis

Status Monitoring

Monitors the current status of an event and reports when it exceeds a defined threshold.

A classic example of active monitoring is being notified before a tablespace fills up.

Status Monitoring monitors…

- Database
  - Database/Listener
  - Alert log error messages.
  - Disabled DB objects, like FKs, PKs, triggers.
  - Tablespace, full or fragmented.
  - Locking.
  - Maximum extents about to be reached.
  - (and a hundred more)
- OS
  - CPU
  - Memory
  - Disk
  - Temp space*

Performance Monitoring

Monitors a defined set of performance statistics. This is done in an effort to maintain the best possible database performance.

Performance Monitoring monitors…

- Database
  - Hit Ratios(dictionary, library, buffer caches, etc)
  - Latches
  - Locks
  - Waits
  - V$ views…
  - (and a hundred more)
- OS
  - CPU

Trend Analysis Monitoring

Collects the historical data surrounding specified events. This historical data is analyzed on a scheduled basis in an effort to reveal any potential problems.

A good example of TA monitoring is watching the growth of data in a tablespace and predicting when it will fill up. In this situation, perhaps the tables or tablespaces were incorrectly sized. So at this point, some time can be spent fixing the real issue.

TA Monitoring monitors…

- Database
  - Database/Listener has been down when and for how long?
  - Alert log – reoccurring error messages, etc.
  - Disabled DB objects, like FKs, PKs, triggers consistently, yell at developers?
  - Tablespace is filling up or fragmenting, perhaps sizing is wrong, etc.
  - Locking - patterns in the locking, missing FK indexes, etc
  - Maximum extents about to be reached. If this happens regularly then perhaps it's time to look at the extent size.

- OS
  - CPU –high CPU usage, need more CPUs?
  - Memory – high memory usage, need more memory?
  - Disk – disks are steadily filling up, predicting when more disks will be needed.
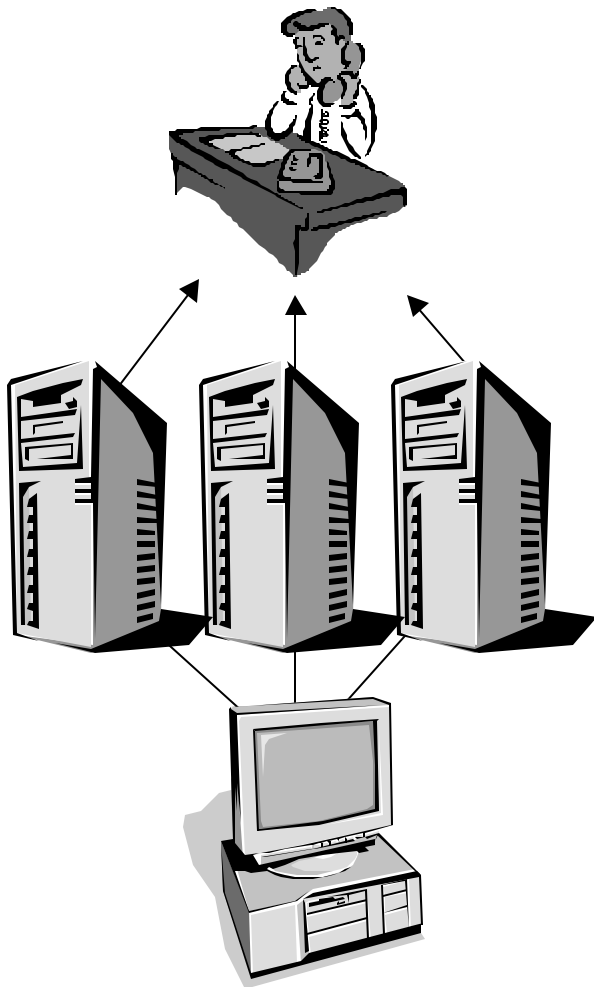
TA "completes" the others...
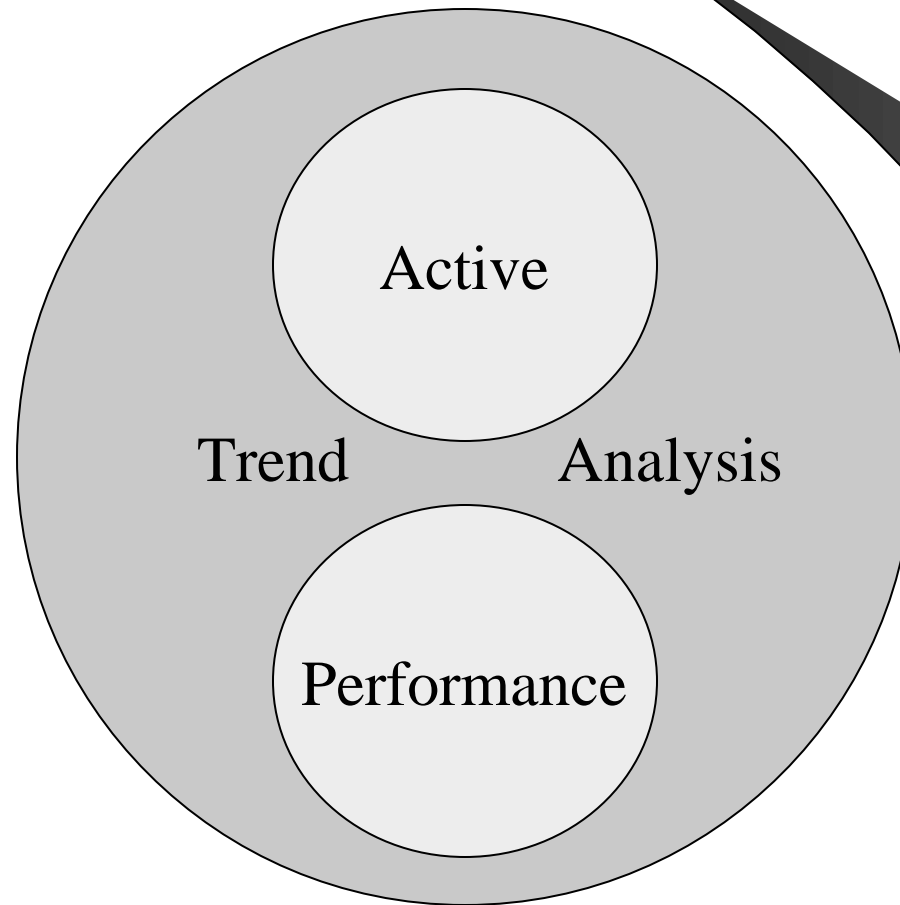
Active

Trend   Analysis

Performance

Monitoring Concepts

The following are some concepts to think about when creating or updating your monitoring processes.

Centralized or Decentralized?

In a centralized configuration, the monitoring software or scripts reside on one server. This obviously makes maintenance easier, but if the hosting server fails then there is no monitoring of the databases.

Centralized or Decentralized?

In a decentralized configuration, the monitoring software or scripts reside with the database. This complicates maintenance, but allows for higher monitoring availability.
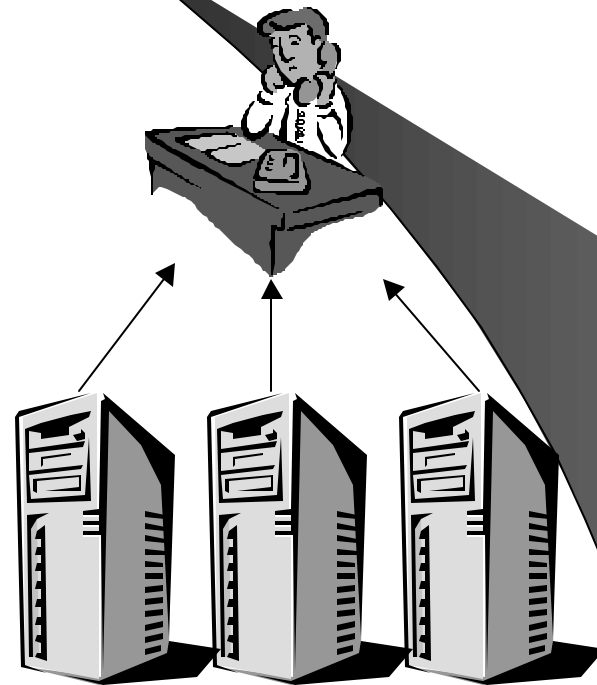
OS independent

If you have databases on multiple OS platforms then consider coding the monitoring scripts in a common language, such as PERL. If this complicates the process then consider a centralized approach by choosing one of the platforms as the host.

DB or OS Hosted?

Database Hosted

- Inside the database.
- OS independent.
- Slightly more difficult to setup.

Operating System Hosted

- Very flexible and powerful.
- Easier to setup.

UNIX Hosting Example

Is this an organized, easy to maintain crontab?

```
00 9 * * 0-6 /disk2/app/oracle/local/chktblspc.scr
00 01 * * 0-6 /disk2/app/oracle/local/dailyrpt.scr
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/chkproddb.scr
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/chklistprod.scr
00 6 * * 0-6 /disk2/app/oracle/local/chkFKs.scr
00 6 * * 0-6 /disk2/app/oracle/local/chkPKs.scr
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/chkarchdir.scr
00 7 * * 1 /disk2/app/oracle/local/chkfileio.scr
00 7 * * 1 /disk2/app/oracle/local/chktempspace.scr
00 1-24 * * 0-6 /disk2/app/oracle/local/chklocks.scr
00 6 * * 0-6 /disk2/app/oracle/local/chkTRGs.scr
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/chkdevdb.scr
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/chktstdb.scr
00 7 * * 1 /disk2/app/oracle/local/chkostempspace.scr
00 7 * * 1 /disk2/app/oracle/local/chkosdiskspace.scr
.
.
```

UNIX Hosting Example (cont)

This is an organized, easy to understand and maintenance free crontab.

```
00,10,20,30,40,50 * * * 0-6 /disk2/app/oracle/local/mon10min.scr
00,30 * * * 0-6 /disk2/app/oracle/local/mon30min.scr
00 1-24 * * 0-6 /disk2/app/oracle/local/mon1hour.scr
00 6 * * 0-6 /disk2/app/oracle/local/mon1day.scr
00 7 * * 1 /disk2/app/oracle/local/mon1week.scr
```

Types of alerts

- Informational messages.
- Warnings.
- Errors.
- "Update your resume."

Support multiple databases

- Database monitoring should be able to monitor multiple databases with ease.

- Perhaps the monitoring scripts can query tnsnames.ora for a list of databases.

- If your using UNIX, then perhaps it can query the oratab file.

Collect historical data

- Try to collect historical data even if your not performing trend analysis monitoring.

- Collection of historical data does not need to be fancy. It could be as simple as writing messages into a flat file or simple table.

- The value of this data will become apparent and help motivate you to start trend analysis monitoring.

Microsoft Outlook Rules

- Update your Outlook rules to route monitoring emails into specific folders based on urgency or other factors. In the future, these folders can be searched, i.e.. historical data.

- Urgent emails can cause Outlook to play a .wav file, like a siren or an appropriate verbal message. This may come in handy if you do not have a beeper.

- Outlook rules can also display a pop-up dialog based on criteria you specify.

Monitoring…resolution

- For often occurring events, consider updating the monitoring script to report the problem and resolve it. *
- If an event occurs often then perhaps there is a bigger issue to resolve. This is where collecting simple historical data or starting trend analysis monitoring can help solve the bigger issue.

Keep everyone informed

- DBAs – obviously your fellow DBAs should also receive monitoring emails or pages. *
- System Administrators – these folks will need to know about any emails or pages they will receive about OS related issues.
- Management – should be made aware of these new processes. And any trend analysis reports can be added to your status reports.
- Resume – lastly, don't forget to update that very important document and repost it to monster.com. You just never know…

Additional Resources of Info

- Oracle Enterprise Manager
- 3rd party products
  - Patrol from BMC
  - I/Watch from Quest
  - Q Diagnostics from Savant
- Books
  - Oracle DBA Handbook, Kevin Loney
  - Oracle DBA 101, Marlene Theriault, Rachel Carmichael, James Viscusi
- Conference presentations
  - Life Without Tools: Monitoring Database Activity With the Power of SQL, Ari Kaplan
  - The Oracle Instructor's Handbook of DBA Tips&Tricks, Chris Fool
  - How to Select a Monitoring Solution for E-Business Environments, Haim Kopans

Share experiences

- Audience to share any positive or negative experiences with monitoring?
- Any non-vendor DBA recommend a 3rd party monitoring product?

Conclusion

- Motivated to start or improve monitoring processes.
- If you have a budget then purchase a good monitoring product.
- If not then start with small and attainable monitoring goals when writing scripts.

Questions

?