

# How to be a Great Production DBA



SOARING EAGLE  
CONSULTING

*Because Performance Matters*

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# About Soaring Eagle

Since 1997, Soaring Eagle Consulting has been helping enterprise clients improve their Application Performance Management, (APM) at the database tier, arguably the most volatile and critical component of distributed application architecture. Our clients range in size from fledgling startups through Fortune 100 companies and leading financial institutions.

Soaring Eagle has been a leader in software development, architecture, performance and tuning databases, while promoting mentoring and training all over the world for over a decade. Many of our employees, and partners have written books, speak at seminars about leading edge technologies. We have expertise in all business tiers, financial; health, manufacturing, government agencies and many ecommerce businesses.

## Consulting

- Performance & Tuning
- Application Performance Management
- Emergency Triage
- Performance audits
- Staff Augmentation
- Project management
- Database architecture
- Scalability assessment and planning

## Training

- Onsite/Web based
  - Microsoft
  - Sybase
  - Oracle
  - APM

## Managed Services

- Remote Database Management
- Performance management
- Emergency db Service
- Database Help Desk
- Problem notification
- Problem resolution

## Software

- Application Performance Management
- Database performance accelerators
- Database performance management
- Application Development

OverSight<sub>db</sub>

rpm™  
remote  
performance  
monitoring

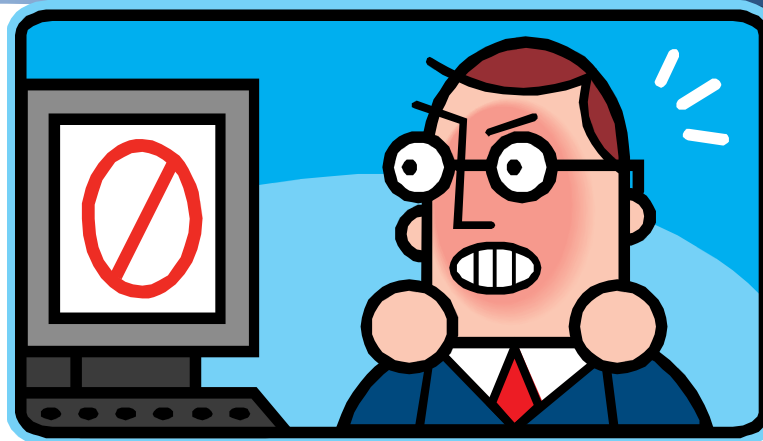
CONFIO  
SOFTWARE



# Production DBA vs. Development DBA

- There are 10 kinds of people in the world; “those who understand binary, and those who don’t.”
- There really are 2 basic types of DBA: Production DBAs and Development DBAs.
- This presentation focuses on Production

# Production DBA



Failure to perform basic maintenance and monitoring can hurt in a variety of ways:

- Performance issues snowballing
- Database Server corruption, system crash, or other
- When your production database server goes down, your business stops
- ... or a hundred other scenarios

# Preventative Maintenance

- When servers and Database Servers are not properly maintained:
  - Performance degrades
  - Consistency is at risk
  - Cleanup of ancillary process does not occur
- Lack of preventive maintenance is probably the most common omission to sting the new DBA
- Accurate statistics are vital for proper execution plan formation
  - Failure to keep statistics up to date are frequent causes of later consternation
  - Check that storage is being used efficiently

# Preventive Maintenance

- At a minimum, PM on an Oracle Server comprises:
  - Backups (full/incremental/possibly logical)
  - Statistic maintenance (tables/indexes)
  - Index maintenance (reorg/rebuilds)
  - Clipping/rotation of Alert Logs, Listener Logs, Audit Logs, etc.
  - Trace file cleanup
  - Older backup file cleanup

# Keeping Statistics up to Date

- Oracle has a cost-based optimizer
  - identifies the distribution of the data
    - crucial for determining join orders, index selection, or lack of same
    - to perform this critical task as often as necessary
- High-volume environments
- Statistics
  - Auto-update vs. manual update

# Keeping Statistics up to Date

- Tips
  - Large tables? Update the system based on a sample
    - a 10% sampling can be as consistent as 100% sampling
  - Update statistics as often as you can
  - Enable parallelism
  - Auto Gather\_Stats job can be adjusted





# Reorganize Data

- Rebuild and/or reorganize your indexes as part of your basic maintenance when they reach a B-Level greater than about 4
  - Indexes are mostly self-balancing in 11g
  - Turn on index monitoring to identify and eliminate unused indexes

# Recording Run-Time Data

***Backup controlfile to trace***

***Create pfile='xxxx' from spfile***

- Archived copies of these two files can be invaluable if you need to rebuild a database after a catastrophic failure

# Application Performance

- Know how to identify what application components are running slowly?
- Common mistake = “throw hardware at the problem”
  - Usually only masks the problem while it snowballs, and that for a short period of time
- Get a good tool (ask us for recommendations)



# Disaster Recovery

Do you have a disaster recovery plan?

- Always ask how each plan could go wrong
  - Include the location of physical Database Server dumps and any configuration data that would be used to re-construct the server
  - Enlist the aid of a practical joker
- Test written plans extensively and often
  - Use least experienced DBA to test it

# Database Dumps

- Regularly take logical backups via export or datapump
- Get a copy of the backups in a secure off-site location
- Keep track and maintain a record of the dumps

# Transaction Log Backups

- Oracle archive logs provide an incremental backup
- Make sure you back these up and get them off site
  - For incremental and redundant backups



# Log Management

- Audit and Archive Log Destinations must be monitored to prevent them from filling up
- Running out of space for audit entries stops all activities that are configured to be audited
- Running out of space for archive logs stops all modification to the database server
- Consider a DataGuard Physical Standby with automatic log shipping to a remote location

# Script Maintenance

- It may become necessary to attempt a complete rebuild of an Oracle database
- Have scripts ready that can perform the installation, configuration, and population of the Database
- Keep up-to-date scripts
- Keep the scripts on a different machine



# Verifying Backups

*"Any administrator can perform a backup. A useful administrator can perform a restore."*

- Get a separate server set aside for periodic testing
- Provides an excellent rehearsal for a real disaster
- Great exercise for JR DBAs & operations staff (if they are separate) to validate run books at the same time as the backups.

# Device Management

- There are a variety of DBMS resources that require frequent I/O (tempdb, logs, heavily hit tables)

## Predictive Analysis

- Measure and monitor things like Database Server growth or you won't have a way to plan



# Disk

- Spinning disk has a finite life
  - Redundancy is not important, it is critical
  - Avoid RAID 5 in an OLTP situation, regardless of what the hardware sales guy says
  - RAID 10 works well
- The world is moving away from spinning disk, currently towards flash arrays (as opposed to SSDs) ...(we can talk about this offline)

# Physical Architecture

- Decisions need to be based upon facts, knowledge of your business requirements, and experience

## **Application architecture**

- DBA's = good resource when you start to design your application flow

# Software Maintenance

- Roll out the new patches as soon as you know somebody who hasn't been burnt by the patch.
- The goal is to not wait too long

# Business Continuity

**Over 60% of businesses fail after catastrophic data loss**

- Have a long term plan

## **Hardware Performance**

- When ordering your server hardware:
  - know what the DBMS performance has been
  - to know which performance spikes are aberrations and what is normal
  - know how to maximize the throughput throughout your bottlenecks



# Business continuity

- Create & maintain a run book
  - Define maintenance plans
  - Backup strategies and file locations
  - DR plan
  - On-call lists
  - Authorization lists
    - CRITICAL to being able to take a vacation!

# Developer training

- An oft-neglected but badly-needed area of DBA work is mentoring
- Developers have high aptitude for logical coding, often do not have training in Database Server performance
  - often leads to applications passing user test, but with significant performance issues at rollout



# Personality Attributes of a Great DBA

- Always Learning
  - There is always more to learn
- Meticulous
- Constructive Paranoia – anticipation
  - Keep asking, “What can go wrong?”
  - Frequently takes and validate backups
- Automation
- Communicative
  - Communicate to management early and often
  - Get involved online
  - Lunch-and-Learns
- Continual Improvement
  - “How can I do this better?”



# Summary

- DBA activities requires dedicated support
- Part-time DBA's might not have enough time or training

**Make sure you have  
adequate expertise at hand!**

# Any Questions?

# *Thank You!*

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