



NoCOUG
Winter Conference

Managing production Databases “Best Practices”

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Agenda

✍ Current environments

✍ Best Practices

✍ Performance

✍ Backup and Recovery

✍ Security

✍ Scalability

✍ Availability

✍ Business continuity

✍ Recommendations

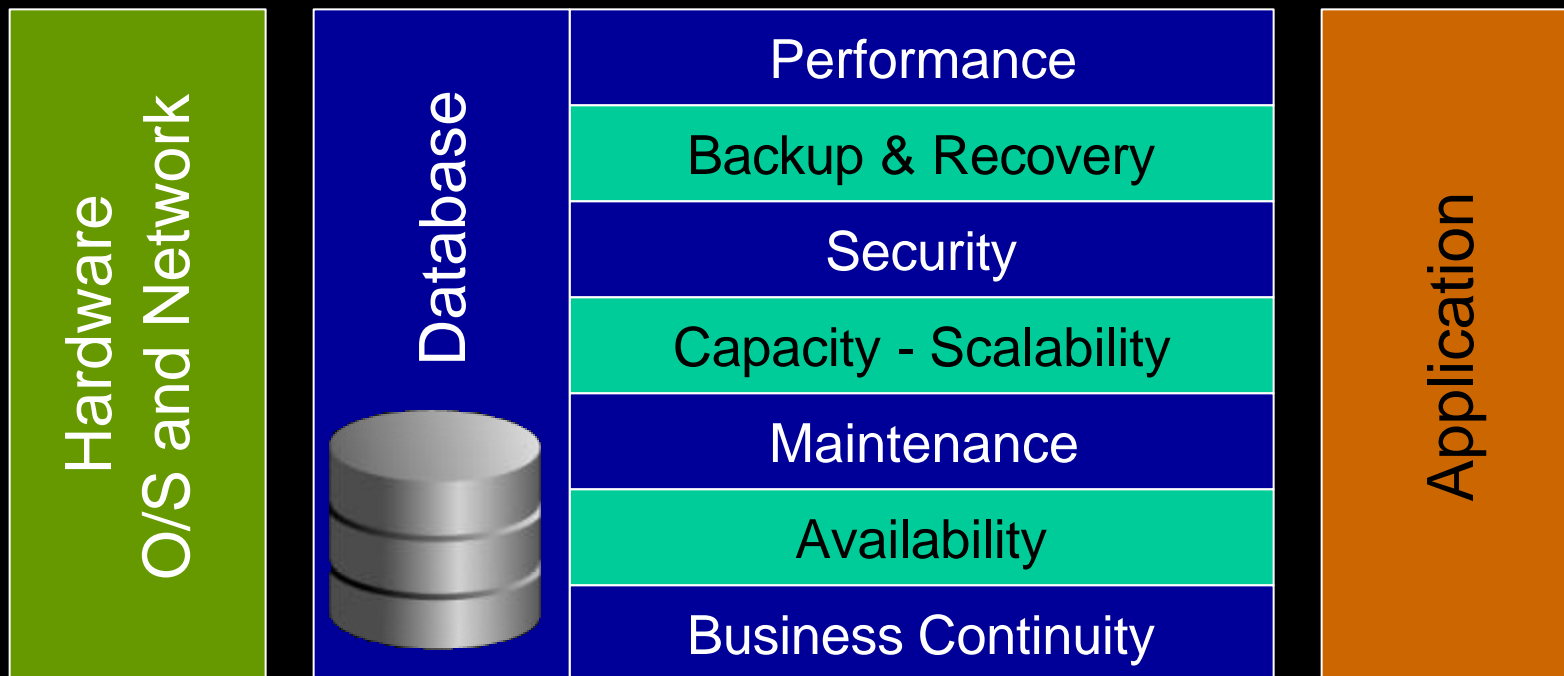


Current Environment

- ✍ Databases critical component for any business
- ✍ Data volumes have grown – Terabyte
- ✍ Mission critical Databases on the rise
- ✍ Application usage increased
- ✍ Greater need for:
 - ✍ Higher availability – 24x7x365
 - ✍ Scalability – large Database, more users
 - ✍ Automation – “online everything”
 - ✍ Security – hack proof
 - ✍ Lower cost
 - ✍ Integrated database tools



Database – a critical component











Performance



Challenges












-  Performance issues – Are you sure?
-  Hardware / Network issues?
-  Slow response of application?
-  What is actually running on the Database Server?
-  What is the CPU/disk utilization?
-  When is it time to upgrade the hardware?

DBA's spend over 30% of time on Performance issues



Performance ...

Recommendations









-  Review the complete stack - OS/DB/HW/SW
 -  Isolate problem
-  Use 3rd party tools –
 -  BMC, CA, Quest, Embarcadero ..
-  Establish a baseline measurement–
 -  Response time / Server Utilization
 -  Generate statistics over time to compare
-  Involve other groups
 -  Server/Network/Apps
-  Communicate to users on performance issues
-  Oracle Resource Manager



Backup and Recovery



Challenges









-  How often do you take backup?
-  What is your business requirement?
-  Can you recover your database?
-  How much data loss can you afford?
-  Where are your tapes?
-  How often are tapes rotated?
-  Is your backup full or partial?
-  Was your last backup successful?

DBA's spend 20% of their time on Backup and Recovery



Backup and Recovery ...

Recommendations








-  Loss of data – immense !
-  Develop a backup strategy involve business owners
-  Identify process and requirements
-  Keep backup log of production systems
-  Deploy backup alert system – notification
-  Take additional backups – Hot Backup and Export
-  Test recovery scenarios
-  For large Databases use 3rd Party backup solutions



Security



Challenges

-  Do you know who is logged on?
-  What roles and privileges are assigned?
-  Have you defined a password aging policy?
-  User privileges – might have more data access
-  Most hacks – internally within the company
-  Database security issues – Listener
-  Web application security issues – SQL Injection

DBA's only spend 5% their time on Security!



Security ...

Why databases are hacked?

- ✍ Customer data (Credit card info, social security)
- ✍ Personnel data (payroll, medical)
- ✍ Technical – proprietary data
- ✍ Financial data, accounting data
- ✍ Competitive data
- ✍ Disrupt your business



Security ...

✍ Recommendations






- ✍ Apply security patches – don't wait
- ✍ Check for vulnerability
 - ✍ securityfocus.com and Oracle website
- ✍ Port 1521 –
 - ✍ block external access
 - ✍ Change port number
- ✍ Change default passwords – sys/system/scott
- ✍ Maintain list of users and privileges
- ✍ Implement password aging policy
- ✍ Keep application admin access restricted
- ✍ Data Encryption
 - ✍ DBMS_OBFUSCATION_TOOLKIT package
 - ✍ Protegrity
 - ✍ Application Security(DbEncrypt)
- ✍ Implement data loss process/procedure



Capacity/Scalability ...



Challenges

-  How scalable is your architecture?
-  Can it support a larger database?
-  How many users access your database today?
-  Do you know how many users will access in future?
-  How often do you perform capacity planning?

DBA's only spend 5% of their time on Capacity Planning.



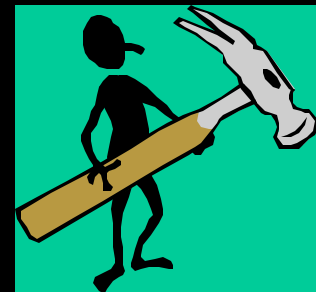
Capacity/Scalability ...

✍ Recommendations







- ✍ Data compression feature
 - ✍ Reduce table size
 - ✍ 20% to 50% space savings
 - ✍ Can impact performance
- ✍ Use Oracle RAC for scalability
- ✍ Perform capacity planning on regular basis
 - ✍ Helps in right-sizing your licenses
- ✍ SAN Storage – offer benefits



Maintenance ...



Challenges










-  Companies do not perform enough testing..
-  How often do you perform upgrades?
-  What are your change Management process?
-  Procedures for outages?
-  How often your apply patches to your env?
-  Continue to see more maintenance...

DBA's spend 30% time on installs, upgrades & patches.



Maintenance ...

Recommendations

-  Define and implement process/procedures for
 -  Upgrades
 -  Installs
 -  Maintenance – hardware/network/OS
-  Implement change management process
-  Perform enough testing and Integrated testing
-  Involve other groups
-  Failover to hot standby for hardware maintenance
-  Provide read-only databases to support critical apps



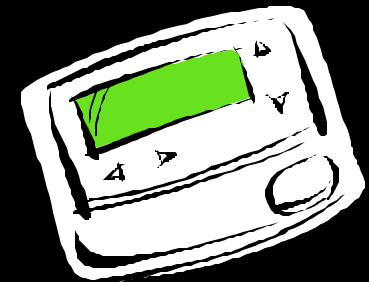
Documentation








- ✍ Perform documentation of Database Env.
- ✍ Document –
 - ✍ Architecture
 - ✍ Configuration
 - ✍ Procedures
 - ✍ Policies
 - ✍ Contacts
 - ✍ Database changes log
- ✍ Use tech writers if necessary
- ✍ Useful for recovery, outages, upgrade
- ✍ Helps in cross-training DBA's.



Availability ...









Challenges

-  Do you really need 24x7x365 Environment?
-  Understand business requirements
-  Just the cost associated with HA.
-  What are your SLA requirements?
-  Are there Database SLAs?



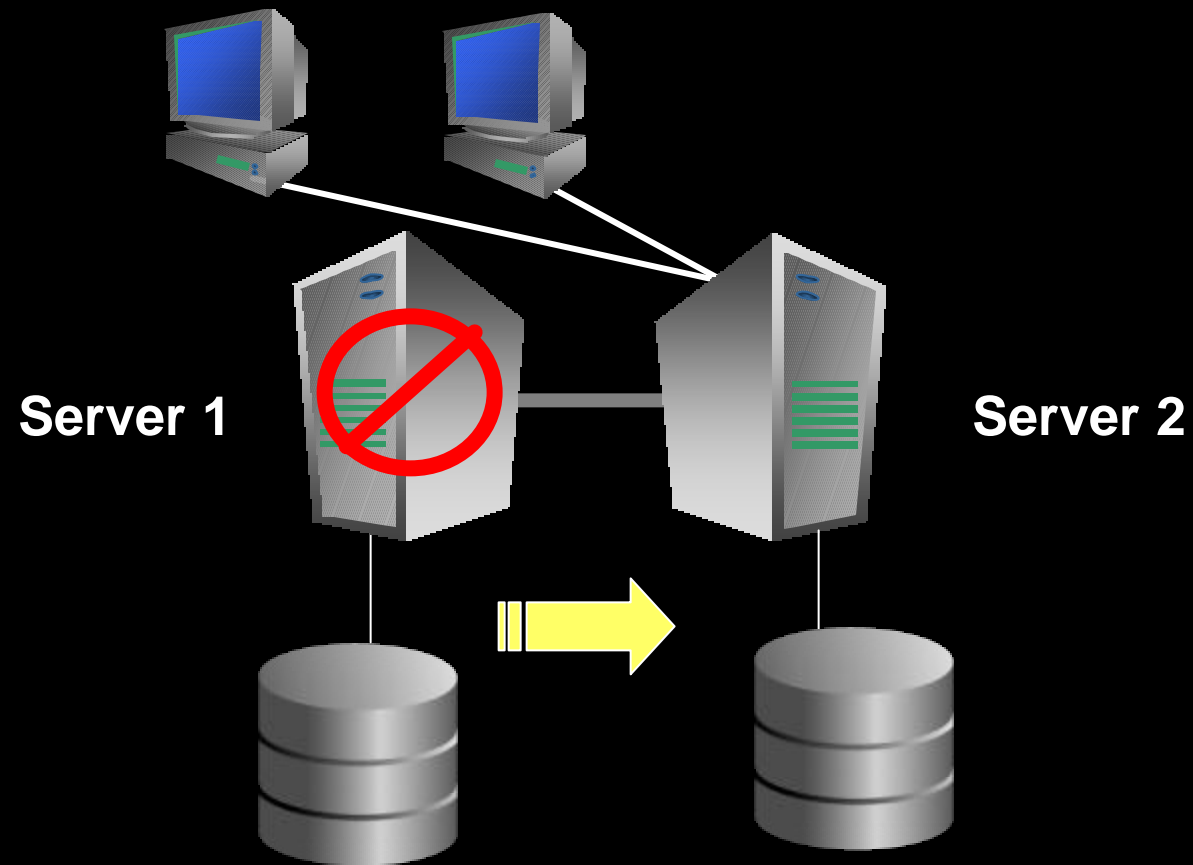
Availability ...

Recommendations

-  Identify applications that need HA
-  Define process/procedure for DB Availability
-  High Availability hardware:
 -  **Server, Storage and Network.**
-  Clustering Solutions
 -  **Hardware, Software and DBMS**

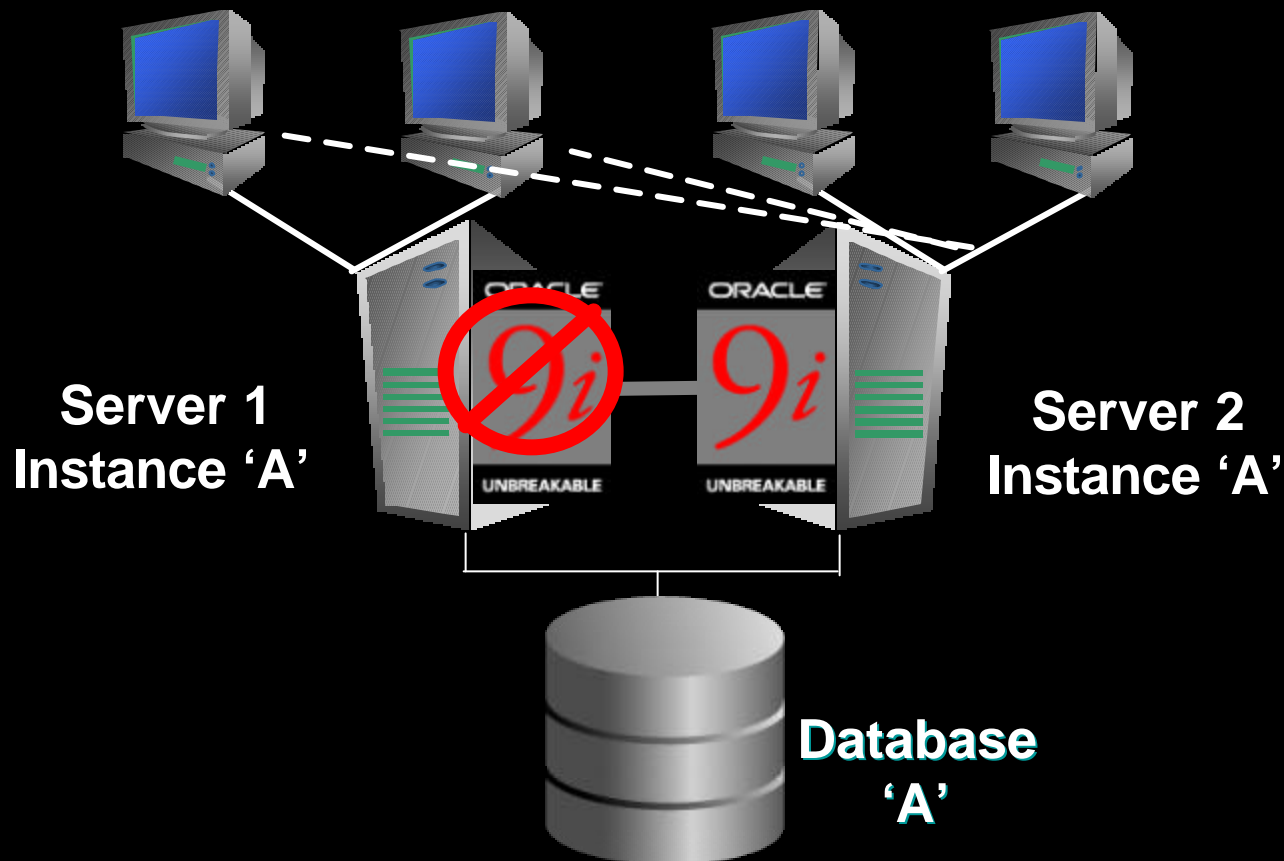


Availability ... Failover





Availability ... RAC

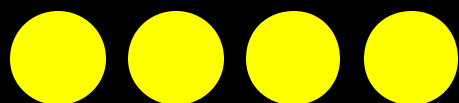


SERVER failure - your database remains available

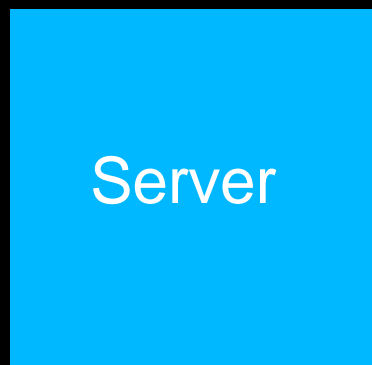


What is Oracle 9i RAC ?

Oracle Instance



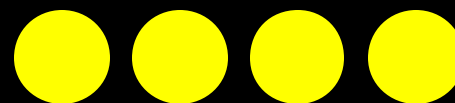
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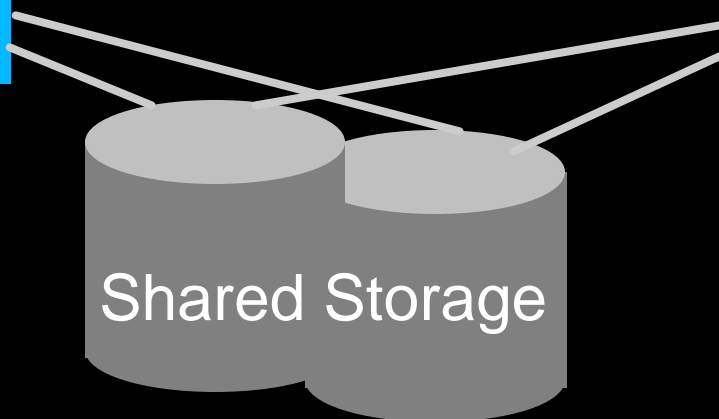
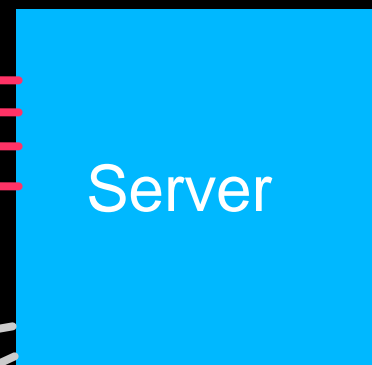
Cluster Interconnect



Oracle Instance



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Shared Storage



RAC Features



Availability

-  Failover

Scalability

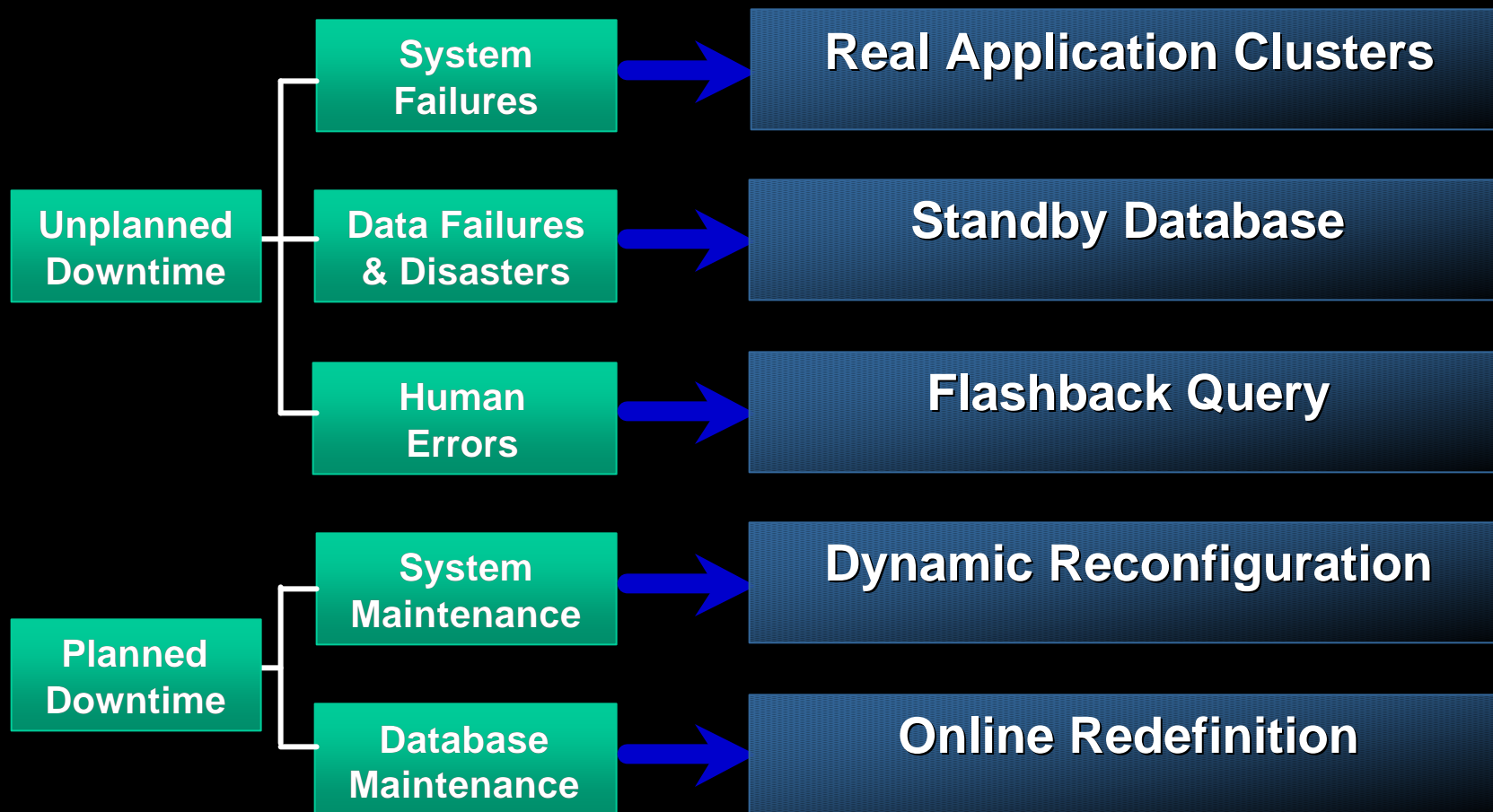
-  No application changes
-  4-6 Nodes Cluster

Manageability

-  No special training or tools
-  No partitioning necessary

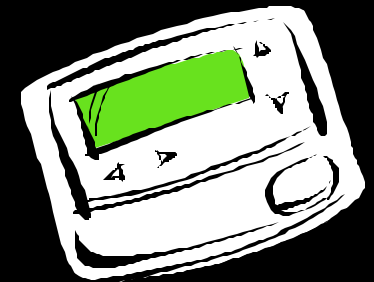


Oracle9i – Availability features











Availability ... Monitoring



Challenges

-  Who monitors your DB?
-  Is it necessary to monitor?
-  Should we monitor all databases?
-  Who is monitoring – Server/hardware/Network?
-  What DB components are you monitoring?
-  Are there process/procedures for monitoring?

DBA's spend 30% of their time on Performance/Monitoring



Availability ... Monitoring

✍ Recommendations

- ✍ Don't just monitor Databases – but complete stack
- ✍ Define a process/procedure for monitoring/outages
- ✍ Use in-house process/scripts
- ✍ Monitoring tools

✍ DBMS Vendors:

- ✍ Oracle, Microsoft, IBM, Sybase

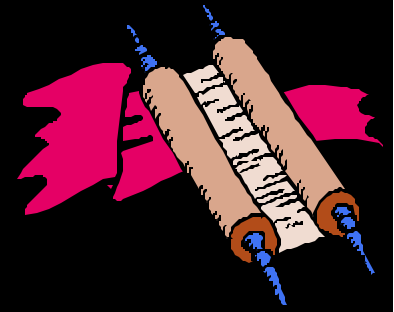
✍ 3rd Party Vendors

- ✍ BMC, CA, Quest Software, Embarcadero, Bradmark

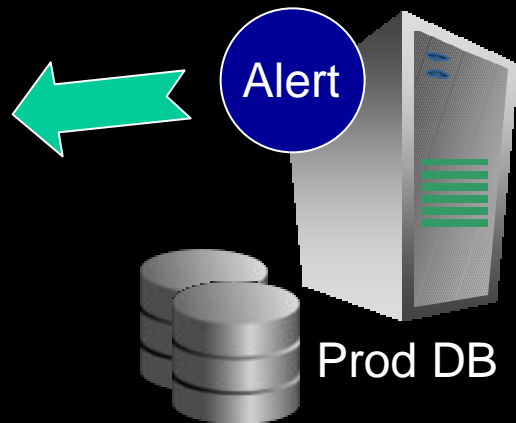


Availability ...

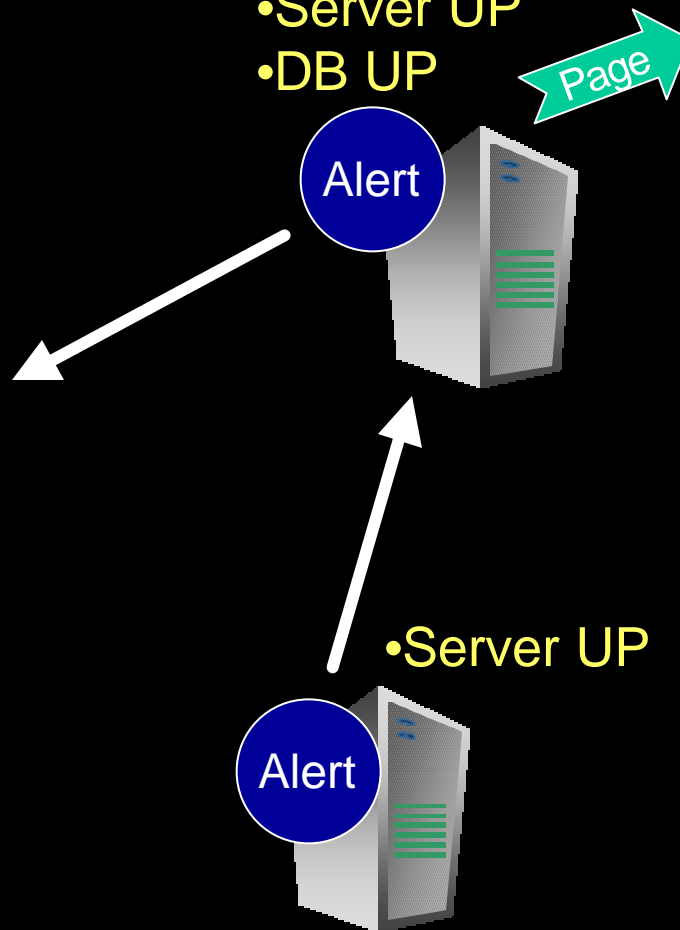
Simple monitoring scripts



- DB UP
- Listener UP
- Alert Log
- Space check



- Server UP
- DB UP



- Server UP





Availability ... Outsourcing

✍ Outsourcing your DBA requirements?

✍ Consultants

- ✍ Local on-site / remote access

✍ Remote DBA

- ✍ Features - deploy agents

- ✍ Database Security issues

✍ Recommendations

- ✍ Cost benefits – review your ROI

- ✍ Outsourcing compliments DBA resources

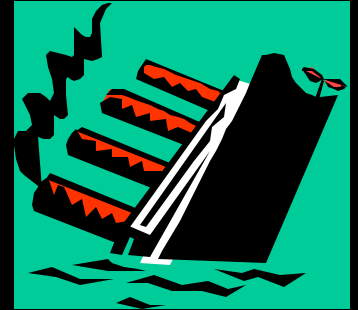
- ✍ Third Party Vendors

- ✍ Dbdirect






- ✍ TUSC



Business continuity



Challenges

-  Do you have a BC Plan ?
-  Are you prepared for any disaster?
-  What are your business requirements?
-  How much data loss can you afford?
-  Typically gets lower priority – cost/resources



Business continuity

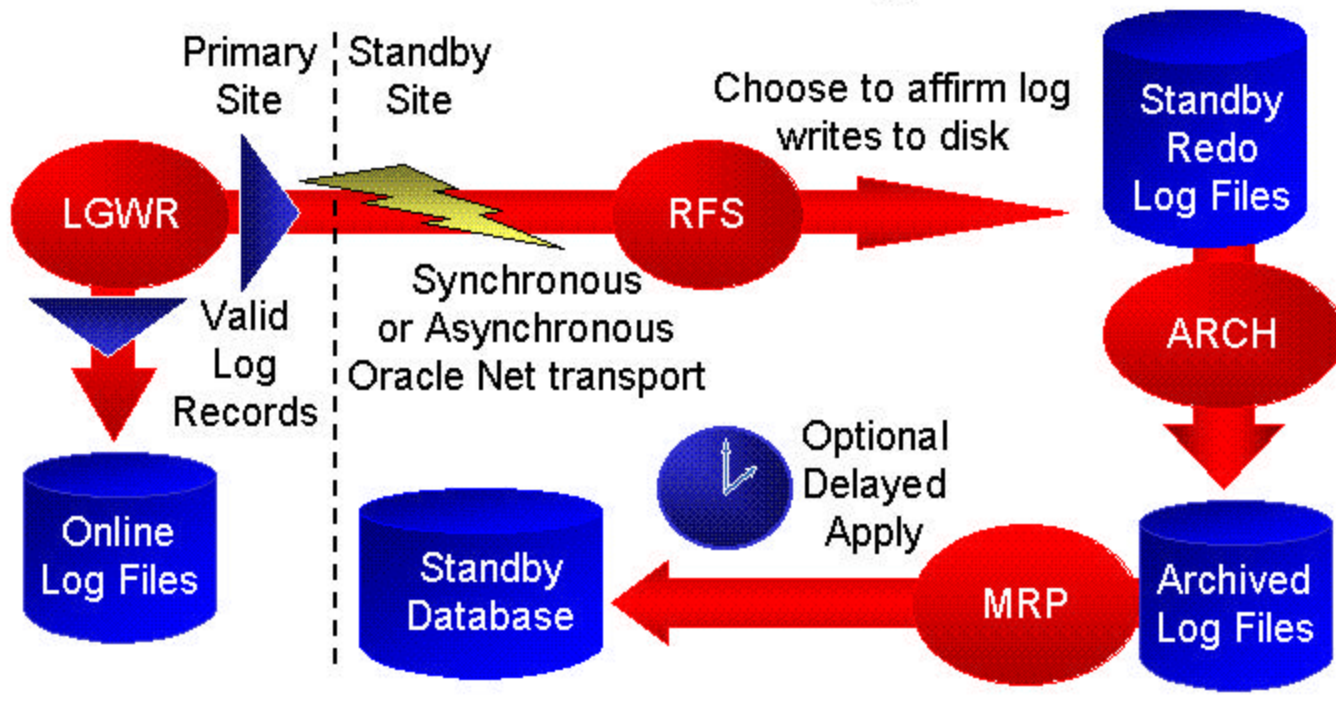
✍ Recommendations

- ✍ Define and implement company wide BC plan
- ✍ If issues – start small and build on it
- ✍ Standby /Dataguard Database
 - ✍ Easy to implement
 - ✍ Widely used solution
- ✍ Asynchronous replication/data propagation
- ✍ 3rd party solutions – BMC, CA
- ✍ Test your solution regularly



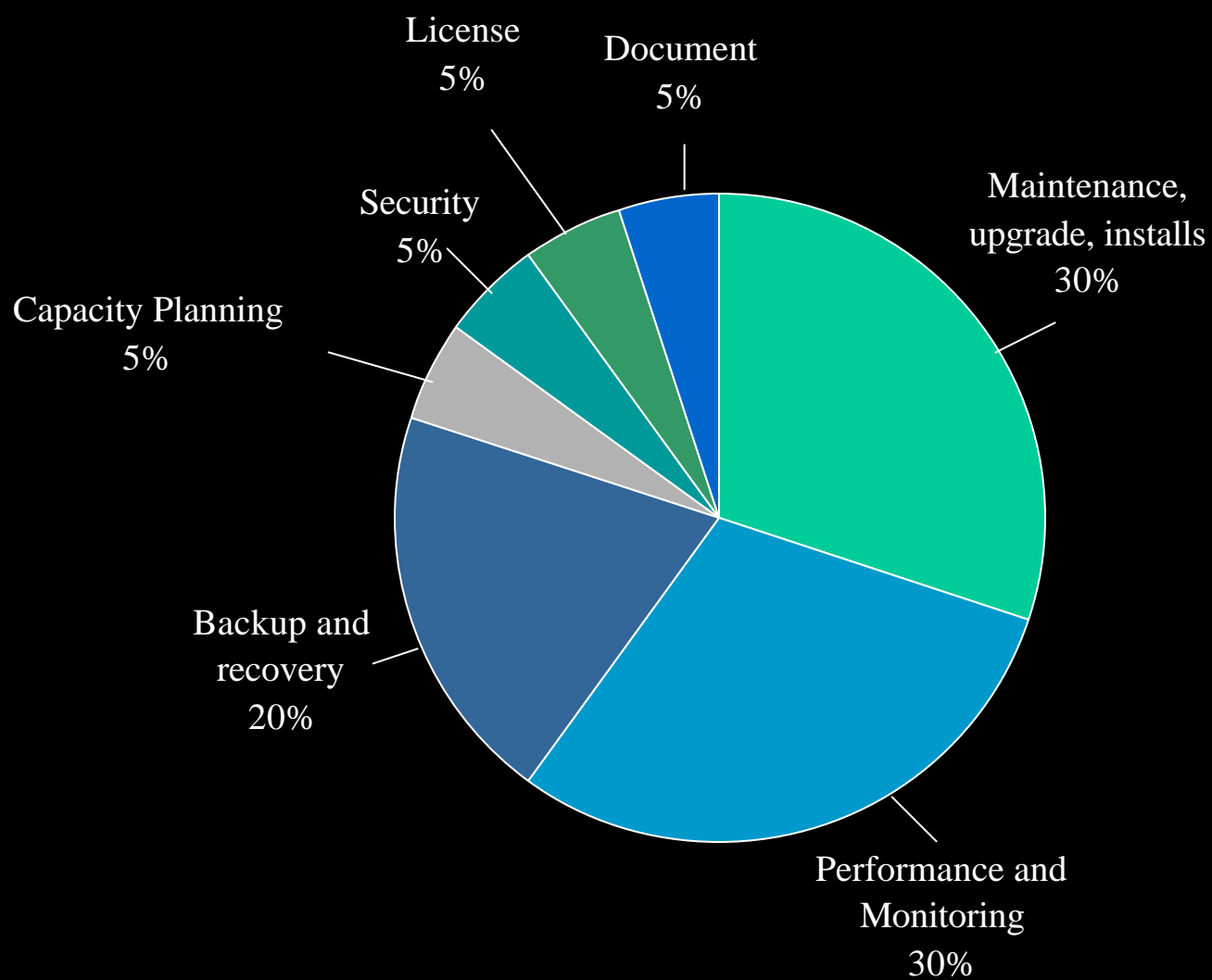
Oracle Data Guard ..

Oracle9i Data Guard Log Data Flow





How DBA's spend their time on Administration?





DBA - Recommendation

✍ How many DBA's do you need ?

- ✍ Typically 1 DBA can manage 1 TeraByte
- ✍ Limited to 20-25 Databases per DBA

✍ How to make DBA's more productive?

- ✍ Use Tools – monitoring/admin/capacity plan
- ✍ DBA's should work with other groups
- ✍ Training – DBMS and application
- ✍ Interact with Oracle community – user groups
- ✍ Perform recovery drill



Recommendations - Summary

Performance

-  Use tools, establish baseline, work with other groups

Backup and recovery

-  Develop backup strategy, Test recovery, 3rd party solutions

Security

-  Apply security patches, Port 1521, Default Password, Encryption

Capacity/Scalability

-  Compression, RAC – Scalability, Capacity Planning, SAN storage

Maintenance

-  Process/Procedure – Upgrade/Install, Change Mgt, Other grps, doc

Availability

-  Identify Apps, Clustering solutions – HW/SW/RAC.

Monitoring

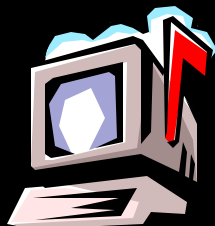
-  Complete stack, Scripts, 3rd party tools, outsourcing, Remote DBA

Business Continuity

-  Planning, Standby/Dataguard, Replication, 3rd party, Testing



Q & A



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