



Introduction to Oracle Database Administration for UNIX Systems

Kapil Taneja

Sr. Unix System Administrator
ZLB Behring

ZLB Behring Intro

ZLB Behring is a global leader in the plasma therapeutics industry.

The company's broad portfolio of life-saving therapeutics are used in the treatment of individuals with hemophilia, immune deficiency disorders and inherited emphysema.

www.zlbbehrlng.com

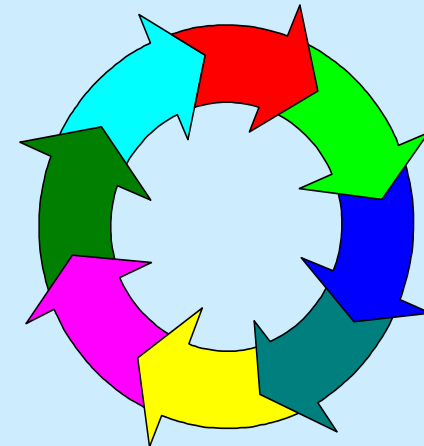
“One of the great dangers in having a career is getting bored.”

Itzhak Perlman



Agenda

- When does Oracle DBA need a Unix System Admin
- Overview of Oracle environment
- Oracle on HP-UX and Linux
- Monitoring Oracle
- Oracle commands and Utilities
- Shell Scripting



Tips and techniques to support Oracle database

- Resources
- Summary

Audience

- Are you looking for:
 - How Oracle works on HP-UX ?
 - How Oracle works on Linux ?



Objective

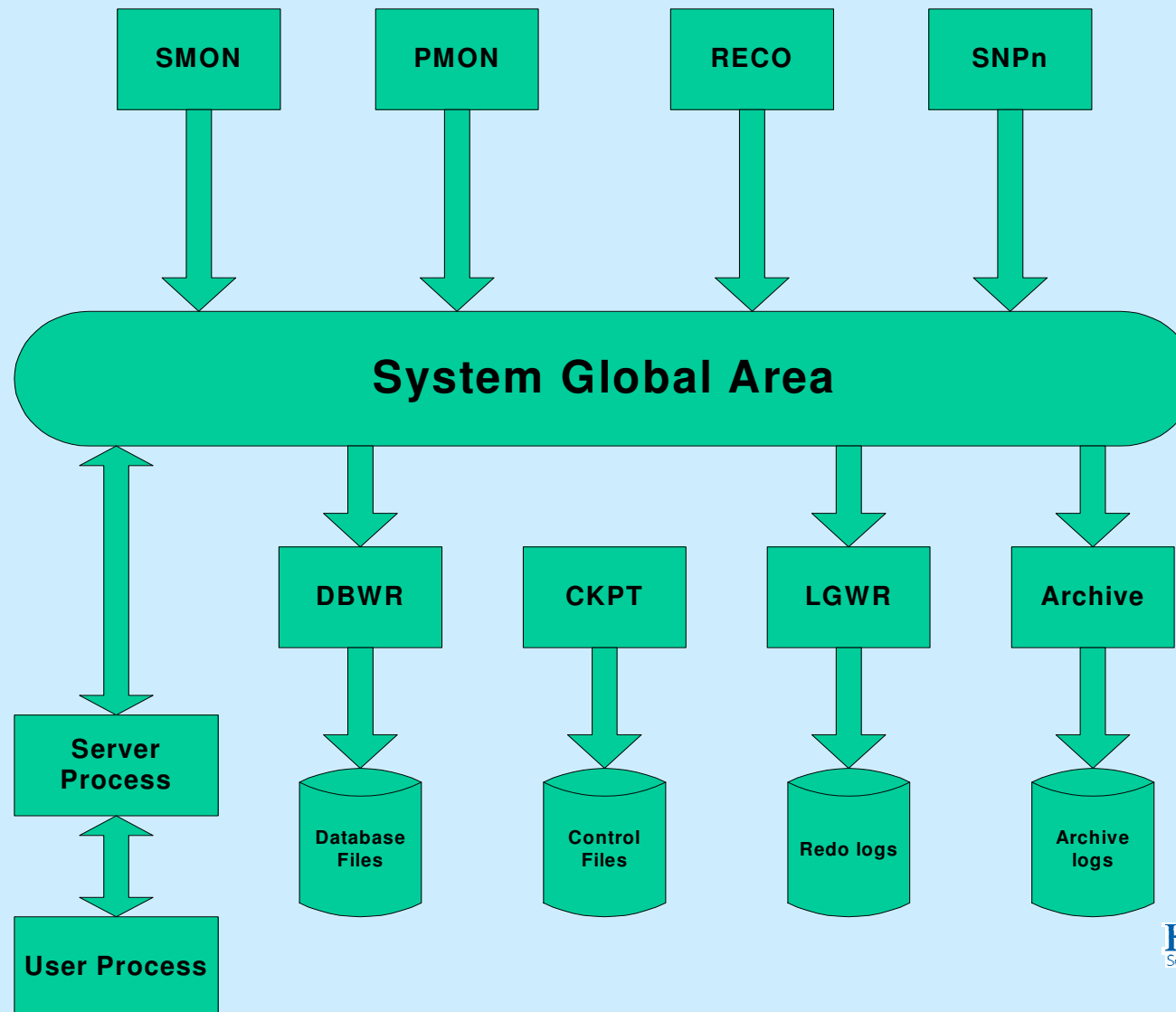
- Support/Setup of Oracle on HP-UX
- Support/Setup of Oracle on Linux
- Support tips that are most useful
- Common DBA Understanding
- Working with DBA team



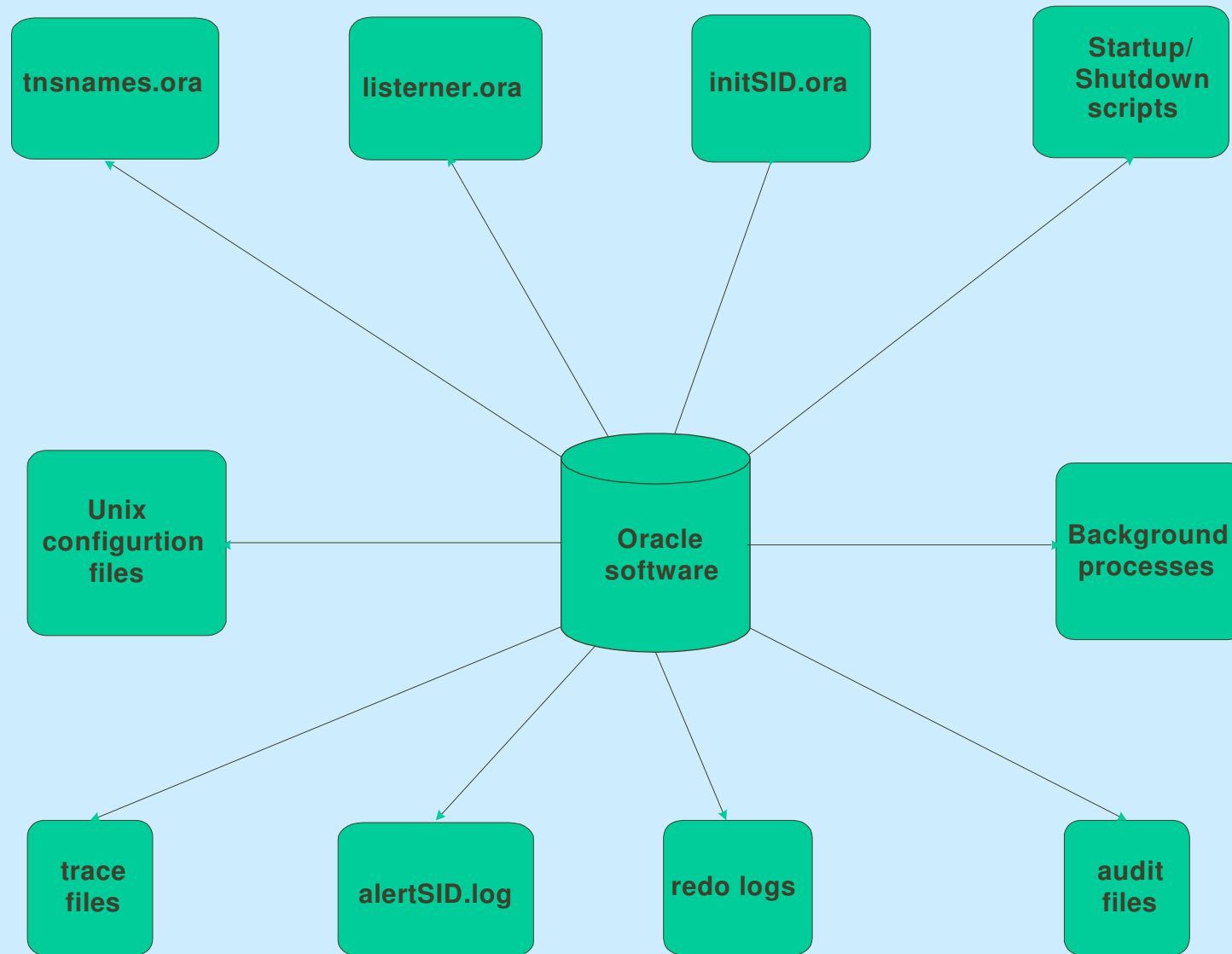
DBA Responsibilities

- Installation of Oracle RDBMS software
- Backup and Recovery Strategy
- Monitoring of Oracle Unix environment
- Monitoring of Oracle Database
- Work closely with the System administrator
- Performance Tuning of Oracle resources
- Perform Oracle security and user maintenance
- Oracle Client software configuration

Oracle Architecture



Oracle on Unix



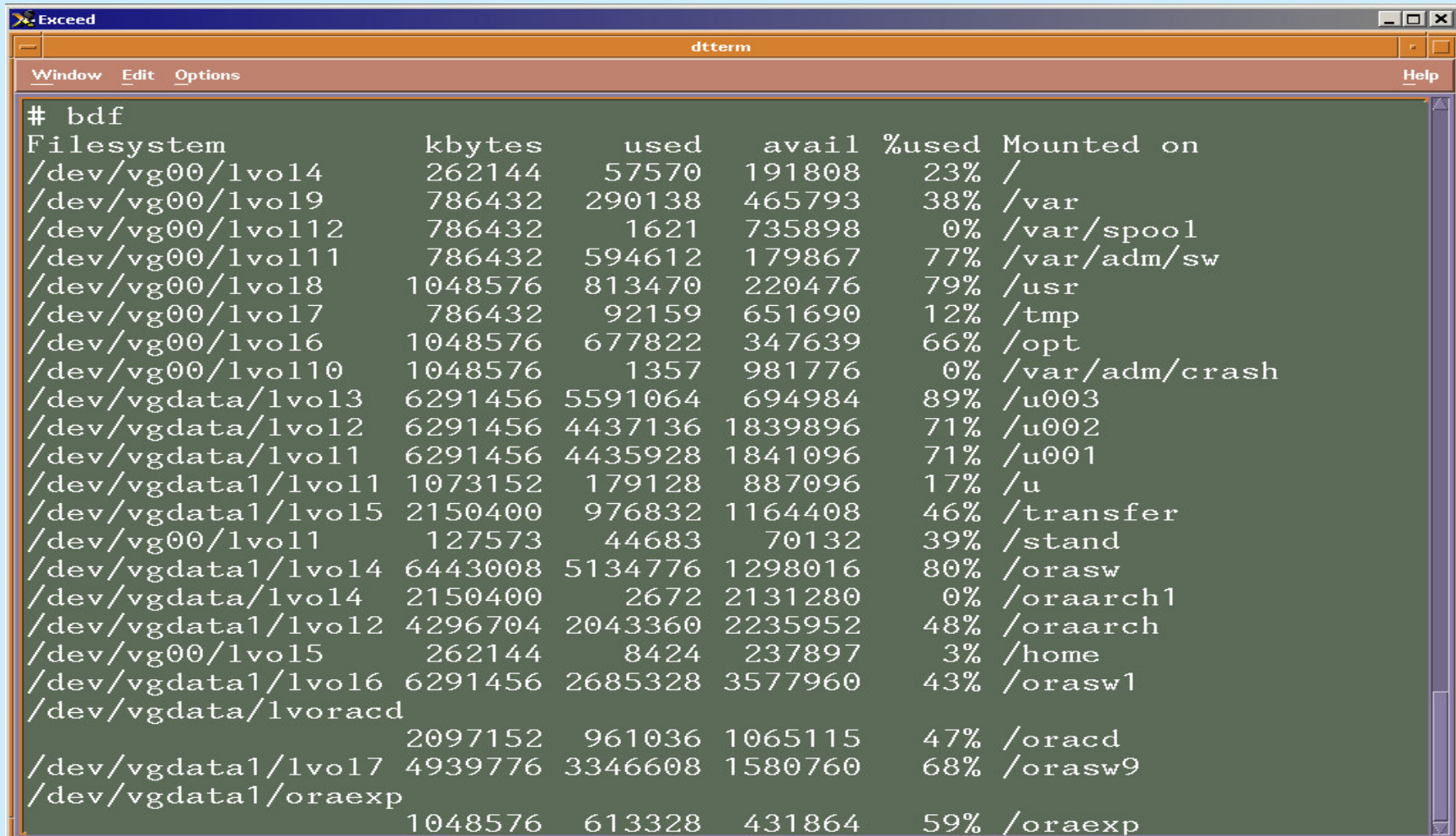
Suffix

- The standard suffix for Oracle datafiles is “.dbf”.
- The suffix for a redo log file is “.log”.
- The suffix for a control file is “.ctl”.
- The suffix for an archive log file is “.arc”.



The actual format for the archive logs is set in the
initSID.ora file.

Unix filesystem Layout



```
# bdf
Filesystem      kbytes    used    avail  %used  Mounted on
/dev/vg00/lvol4 262144    57570   191808   23%    /
/dev/vg00/lvol9 786432   290138   465793   38%    /var
/dev/vg00/lvol12 786432     1621   735898    0%    /var/spool
/dev/vg00/lvol11 786432   594612   179867   77%    /var/adm/sw
/dev/vg00/lvol18 1048576   813470   220476   79%    /usr
/dev/vg00/lvol17 786432    92159   651690   12%    /tmp
/dev/vg00/lvol16 1048576   677822   347639   66%    /opt
/dev/vg00/lvol10 1048576     1357   981776    0%    /var/adm/crash
/dev/vgdata/lvol3 6291456 5591064   694984   89%    /u003
/dev/vgdata/lvol2 6291456 4437136  1839896   71%    /u002
/dev/vgdata/lvol1 6291456 4435928  1841096   71%    /u001
/dev/vgdata1/lvol11 1073152   179128   887096   17%    /u
/dev/vgdata1/lvol15 2150400   976832  1164408   46%    /transfer
/dev/vg00/lvol11  127573    44683    70132   39%    /stand
/dev/vgdata1/lvol14 6443008 5134776  1298016   80%    /orasw
/dev/vgdata1/lvol4 2150400     2672  2131280    0%    /oraarch1
/dev/vgdata1/lvol12 4296704 2043360  2235952   48%    /oraarch
/dev/vg00/lvol15  262144     8424   237897    3%    /home
/dev/vgdata1/lvol16 6291456 2685328  3577960   43%    /orasw1
/dev/vgdata1/lvoracd 2097152   961036  1065115   47%    /oracd
/dev/vgdata1/lvol17 4939776 3346608  1580760   68%    /orasw9
/dev/vgdata1/oraexp 1048576   613328   431864   59%    /oraexp
```

Oracle filesystems

- /orasw Oracle Binaries
- /oraexp Oracle Exports
- /oraarch Oracle Archive logs
- /transfer Test data file transfer and work area
- /u/dba Oracle DBA and APP Staging area
- /u001... Oracle Datafiles

Full path for database files:

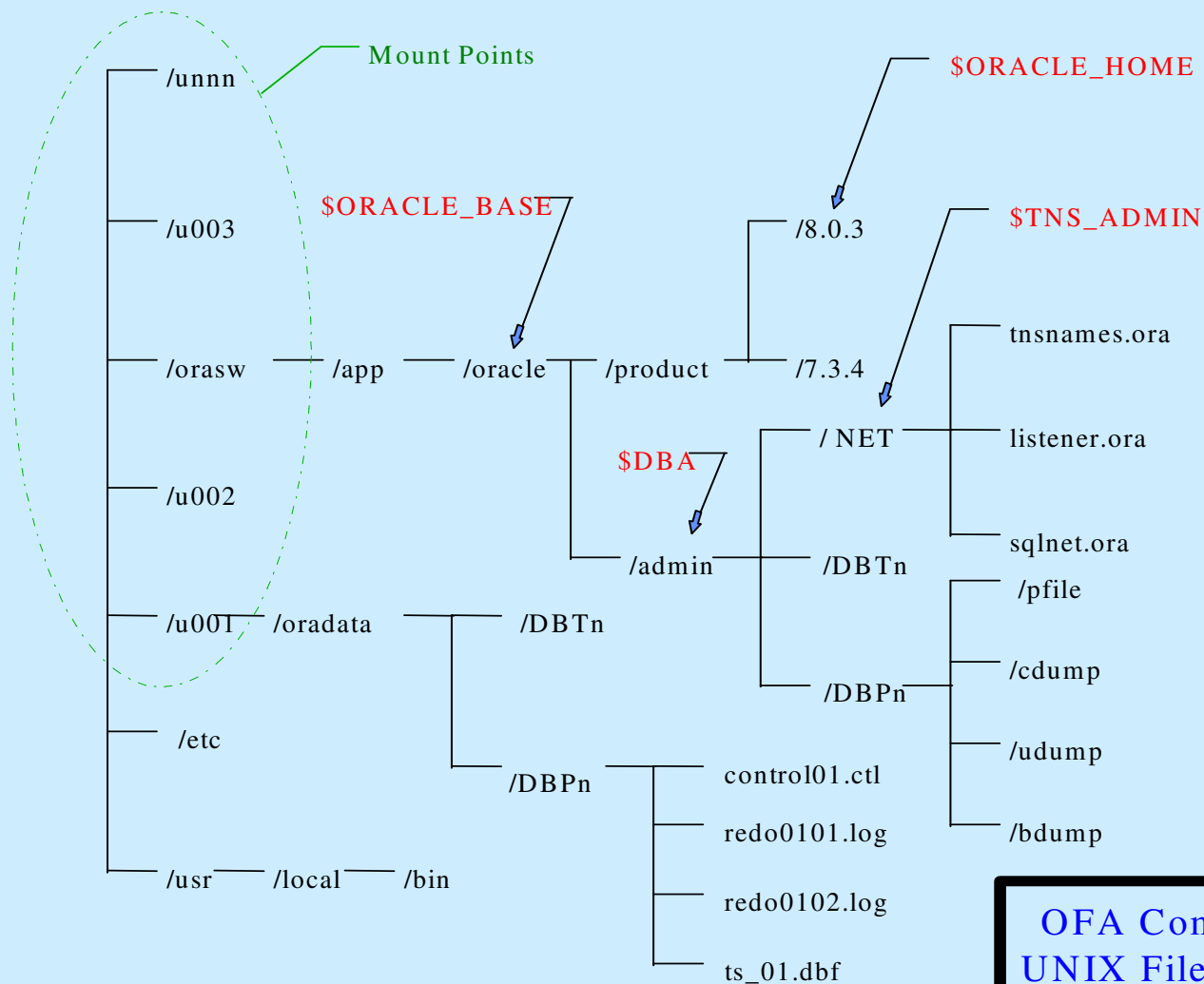
/u001/oradata/DBP1/system01.dbf

/u002/oradata/DBP1/rbs01.dbf

/u003/oradata/DBP1/index01.dbf

/u004/oradata/ DBP1/data01.dbf

Oracle OFA Layout



**OFA Compliant
UNIX File System**

Communication with DBAs

- Planned downtime
- Any issues noticed, space or syslog errors
- Be honest, communicate if you make a mistake
- Involve all stakeholders in email
(Business users, operations personal, managers etc)
- Patch upgrades
- Risks or errors noticed

When does Oracle DBA need a Unix System Administrator

- Pre installation
- Post Installation
- Backup and Recovery
- Performance Issues
- Capacity Planning
- Unix system availability

pfs_mount

- create /etc/pfs_fstab with following entry
"device name" /cdrom pfs-rrip xlat=unix 0
- run pfs daemon at the background
nohup /usr/sbin/pfs_mountd &
nohup /usr/sbin/pfsd &
- start nfs server
/sbin/init.d/nfs.server start
- mount and unmount file system
pfs_mount /cdrom
pfs_umount /cdrom



Fix to pfs_mount issue

Apply patches for rock ridge extensions

e.g. (3 patches on HP-UX 11.00)

PHCO_26449,PHKL_26450,PHKL_28060

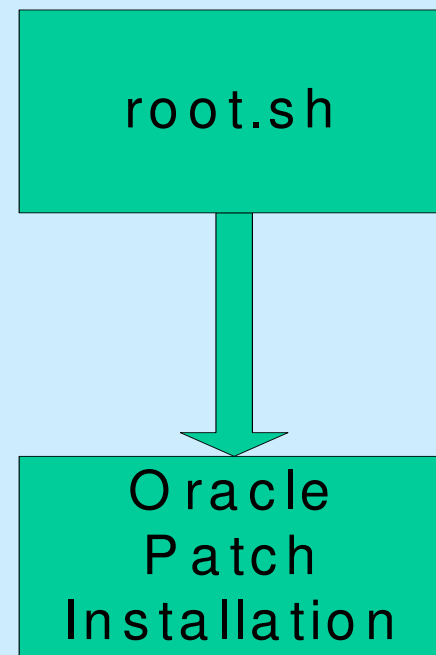
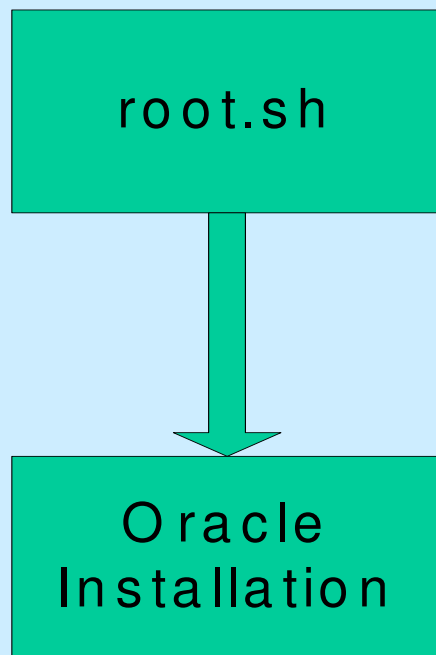
and issue the command to recognize ISO 9660 filesystem.

```
# mount -F cdfs -o rr /dev/dsk/<CD device> /cdrom
```

Unix root access



root.sh updates /etc/oratab file with oracle SID /
HOME information and copies oraenv, dbhome to
system defined path.



Important Oracle Utilities on Unix

oerr	gives the description of ORA- error message
lsnrctl	starts/stops listener or db snmp process
oemctrl	starts/stops Oracle Management server(OEM)
dbv	db verify for checking block corruption
svrmgrl	Utility to startup/shutdown Oracle7 & 8
sqlplus	interface tool to talk to database (Oracle9i)
dbassist	GUI tool to create or remove database
(dbca for 9i, set DISPLAY variable to use GUI tools)	

Examples on Oracle utilities

```
# su – oracle (su to oracle user from root)
```

```
$ oerr ORA 12574
```

(This command will provide error description, cause and recommended action)

```
$ dbv help=y
```

```
$ dbv file="datafile name" blocksize=8192
```

(Default Block 2048)



How to find a Block size?

db_block_size parameter in initSID.ora

startup/shutdown oracle

SQL*Plus (Oracle9i onwards)

*Set environment variables

ORACLE_HOME = /orawp/app/oracle/product/9.2.0

ORACLE_SID= <instance name>

\$ORACLE_HOME/bin/sqlplus /nolog

SQL> connect / as sysdba

SQL> shutdown immediate

To start the database, use startup command

SQL> startup

startup/shutdown oracle

svrmgrl (Oracle7 & 8)

*Set environment variables

ORACLE_HOME = /orawp/app/oracle/product/8.1.7

ORACLE_SID= <instance name>

\$ORACLE_HOME/bin/svrmgrl

SVRMGR> connect internal

SVRMGR > shutdown immediate

To start the database, use startup command

SVRMGR > startup

startup/shutdown oracle

HP-UX boot time

- /sbin/init.d/oracle start/stop

Steps to start/stop Oracle with system startup/shutdown

Set ORACLE_START=1 in /etc/rc.config.d/oracle file

e.g.

Create a link to start oracle

```
# ln -s /sbin/init.d/oracle /sbin/rc3.d/S985oracle
```

Create a link to shutdown oracle

```
# ln -s /sbin/init.d/oracle /sbin/rc2.d/K015oracle
```

startup/shutdown oracle

LINUX boot time

- /etc/rc.d/init.d/dbora start/stop

e.g.

Create a link to start oracle

```
# ln -s /etc/rc.d/init.d/dbora /etc/rc.d/rc3.d/S90dbora
```

Create a link to shutdown oracle

```
# ln -s /etc/rc.d/init.d/dbora /etc/rc.d/rc2.d/K10dbora
```

Monitoring Oracle

- Background processes
- alertSID.log for Oracle errors
- listener processes
- Unix filesystems
- online/offline backup logs

Monitoring pmon

- To ensure database is running, use

```
ps -eaf | grep pmon
```

pmon is an Oracle background process unique for each database



All the instances have entries in /etc/oratab file. This file also tells you the ORACLE_HOME for each database.

/etc/oratab

is an Oracle driving file used during system boot process.

It contains an entry for each instance on the server.

Sample entries:

DBP1:/orasmw/app/oracle/product/7.3.4:Y

T805:/orasmw/app/oracle/product/8.0.5:N

P920:/orasmw/app/oracle/product/9.2.0:Y

Monitoring Oracle errors

- Check alert log file for any errors recorded by Oracle

SET DBA= /oraw/app/oracle/admin

\$DBA/SID/bdump/alert<instance_name>.log



Run a Cron job script to find recent alert in the Oracle alert logs. */u/dba/bin/check_alert.sh*.
Notify appropriate person on successful grep for "ORA-".

Monitoring listener

To check listener

```
# su - oracle (su to oracle user from root)
```

```
$ lsnrctl status
```

```
$ ps -ef | grep tns (HP-UX)
```

```
$ ps -eawf | grep tns (Linux)
```

(lists all the listeners running on the server)

To start the listener

```
$ lsnrctl start
```

To stop the listener

```
$ lsnrctl stop
```

Monitoring OEM Agent

To check agents availability

su – oracle (su to Oracle user from root)

- On Oracle8i

\$ lsnrctl dbsnmp status (check status)

\$ lsnrctl dbsnmp start/stop (to start or stop)

- On Oracle9i

\$ agentctl status (check status)

\$ agentctl start/stop (to start or stop)

Monitor Unix File System size

Notify DBA when following FS reaches a certain threshold limit:

- /orasw
- /transfer
- /prod/transfer
- /u/dba
- /u001...



data FS can grow, if auto extend option ON

Start a backup and clean archive file on completion:

- /oraexp
- /oraarch (archive log mode ON)



How to determine archivelog mode Command Line

To check archivelog mode

```
# su – oracle (su to Oracle user from root)
```

```
$ sqlplus /nolog
```

```
SQL> connect / as sysdba
```

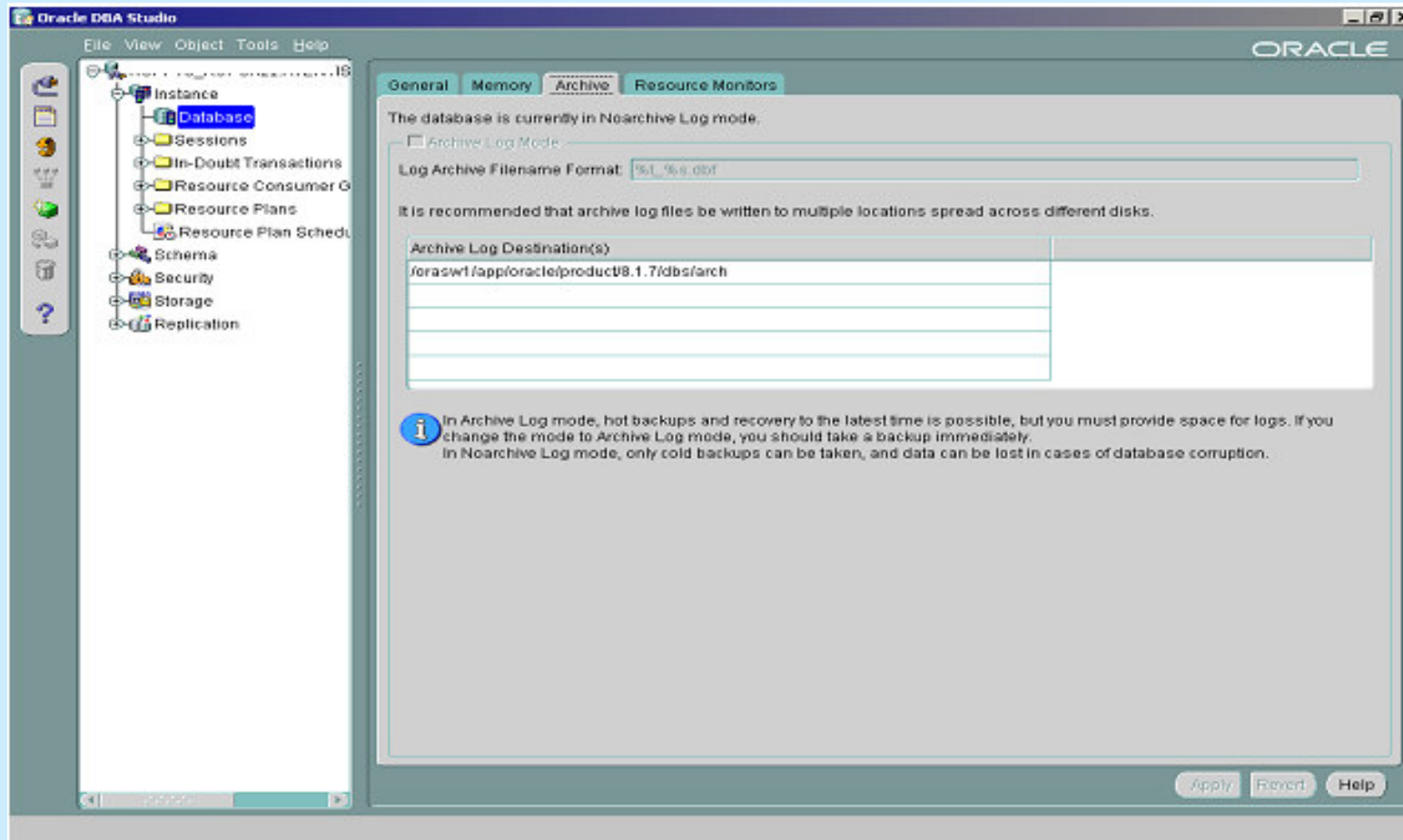
```
SQL> set head off
```

```
SQL > select * from v$database;
```

```
SQL> exit
```



How to determine archive log mode using OEM



Performance monitoring

- gtop (Linux, gui)
- glance (HP-UX, text)
- gpm (HP-UX, gui)
- PerfView (HP-UX, historical data)
- top
- sar
- vmstat

Monitoring Backup logs

- Full backup logs
- Media Management tools (OmniBack, Netbackup)
e.g. Netbackup logs
 - /usr/opensv/netbackup/oracle/logs
- rman logs (Recovery Manager Oracle8 & 9)



Run a cron job to find any “ORA-” errors in rman log file.
e.g. /usr/local/bin/rman/hdb.out (Hot Backup)
/usr/local/bin/rman/cdb.out (Cold Backup)

Types of Backup

- Cold Backup
when database is down
- Hot Backup
when database is up and available to users
- Export
logical backup of a database
- Full Backup
OS and database backup with database down
- Incremental Backup
rman allows to do the incremental backup

Oracle Patch

- tar (oracle8i)
tar -xvf filename.tar
- cpio (oracle9i)
cpio -idcmv < 9204_hpunix_Release.cpio
cpio -idmv < 9204_lnx_release.cpio



How to find an exact Oracle version ?

sqlplus user/password

SQL>select * from v\$version;

Security

- SYS/change_on_install
- SYSTEM/manager
- Change Unix oracle account password periodically
- Set umask 022 in Oracle user “.profile”
- DBSNMP account

Used by OEM Intelligent Agents

Uses the SNMPAGENT role

Default password is DBSNMP



(Oracle9i onwards: oracle prompts you to change the password)



How to change password Command Line

To change Oracle “user” password

```
# su – oracle (su to Oracle user from root)
```

```
$ sqlplus /nolog
```

```
SQL> connect / as sysdba
```

```
SQL> alter user “username” identified by “new Password”;
```

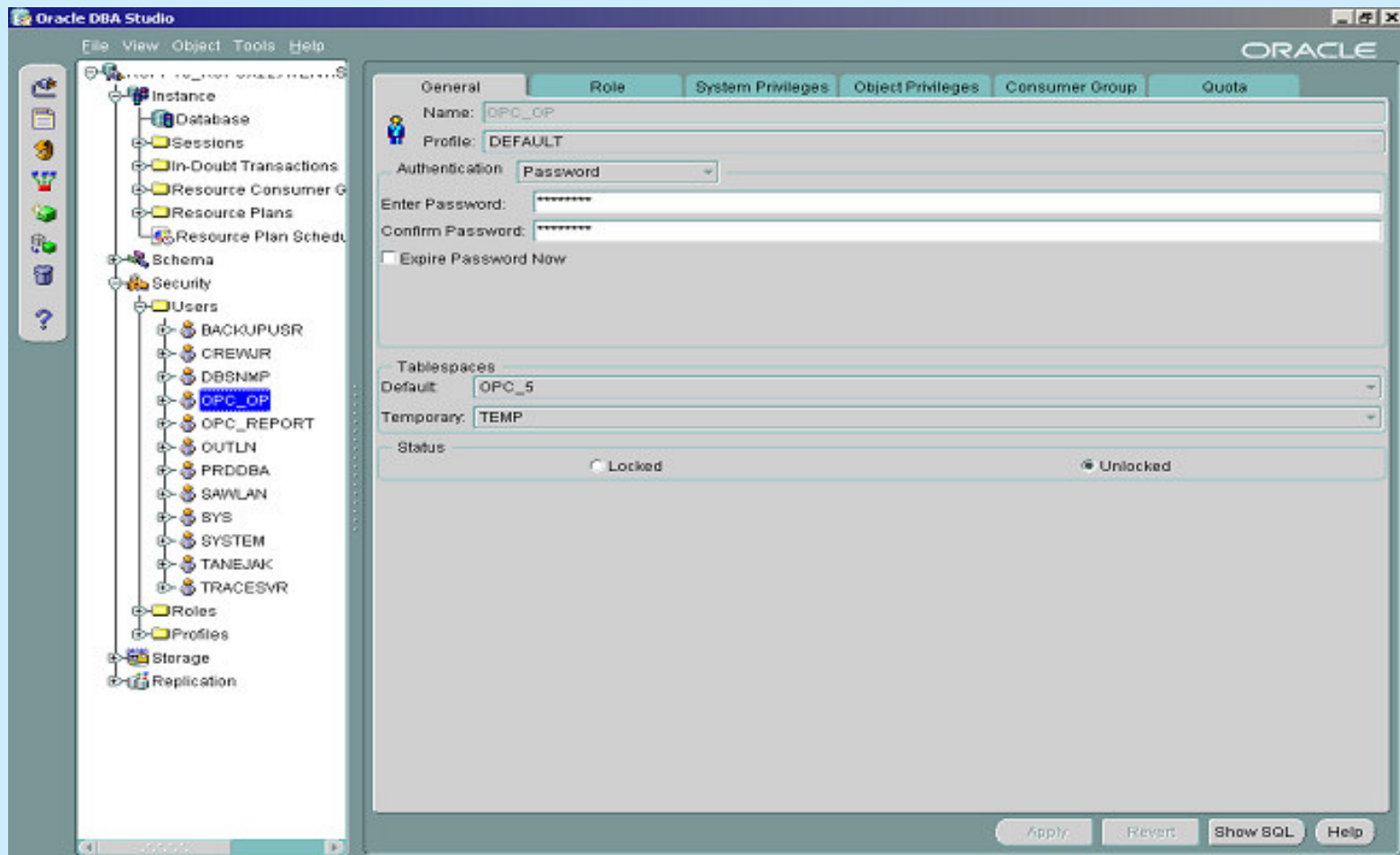
```
SQL> exit
```

```
$ sqlplus username/password
```

```
SQL> exit
```



How to change password using OEM





How to create compressed export file

- Named pipe using *mknod*

e.g.

```
/usr/sbin/mknod exp.dmp p
```

```
cat exp.dmp |compress > fullexp.dmp.Z &
```

```
exp user/passwd parfile=exp.par
```

- Overcome the limitation of 2 GB file

Create a new filesystem with largefiles option



Import compressed file, without uncompressing

- `/user/sbin/mknod exp.dmp p`
`uncompress </path/fullexp.dmp.Z > /path/exp.dmp &`
`sleep 2`
`imp user/passwd file=exp.dmp log=exp.log`

Note:

import is using `file=exp.dmp`, same as the pipe name

SGA and Shared Memory segments

- `ipcs -b`
 `ipcs` shows the size of each shared memory segment for the SGA.
- `ipcrm -m` will remove the segments
- `ipcrm -s` will remove semaphore segments



Do not do the above, unless you have an instance failure, and a subsequent startup or shutdown command did not clean it up

InitSID.ora and Kernel Parameters

InitSID.ora Parameters	kernel parameter
db_block_buffers	shmmax
db_files (maxdatafiles)	nfile, maxfiles
large_pool_size	shmmax
log_buffer	shmmax
Processes	nproc, semmns
shared_pool_size	shmmax

HP-UX kernel parameters

- **shmmax** sets the max size,in bytes, of a single shared memory segments
- **shmmni** sysctlmwide max for the shared memory segments
- **semmns** max number of semaphores
(two times the number of processes)
- **nflocks** max number of files lock available
- **nproc** max number of processes
- **nfile** max number of open files

Linux kernel parameters

- **shmmax** sets the max size,in bytes, of a single shared memory segments
- **shmmni** system wide max for the shared memory segments
- **semmns** max number of semaphores (two times the number of processes)
- **semopm** Maximum number of operations per semop calls
- **semmsl** set to the largest process parameter of the Oracle database +10
- **semmni** semaphores sets for the entire OS



Cleanup time

- Remove old trace files

```
find /u001/oracle -name "*.trc" -mtime +30 -xargs  
rm -f {} \;
```

- Compress export files

```
find $dump_dir -type f -name "*.dmp" -mtime +3 -  
exec compress {} \;
```

- Find files that were created recently

```
find . -mtime -1 -print
```

Differences Linux vs HP-UX

- /etc/oraInst.loc vs. /var/opt/oracle/oraInst.loc
- .bash_profile vs. .profile
- .bashrc vs. .kshrc
- Bash vs. ksh
- /etc/rc.d/init.d vs. /sbin/init.d
- Gnome/KDE vs. HP CDE
- /var/log vs. /var/adm/syslog
- Gnome monitor or gtop vs. glance
- Most native UNIX utilities exist for Linux

Network connectivity with Unix

- **tnsnames.ora** (configuration file for client connection)
- **listener.ora** (list of names and address of all the listener processes)
- **sqlnet.ora** (configuration file with connectivity parameters)



- soft links can be created for **tnsnames.ora** and **sqlnet.ora** in the **ORACLE_HOME/network/admin** directory pointing to the files in **TNS_ADMIN**.
- In **tnsname.ora**, use host name. Do not use IP address.



DBA Good Practices

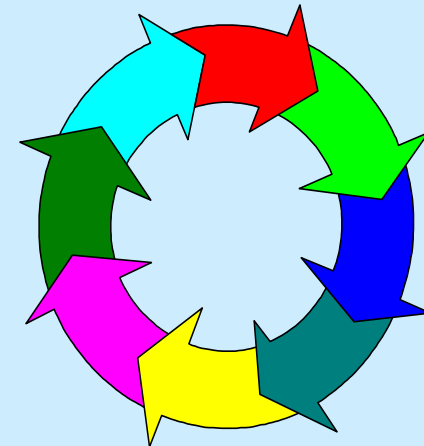
- /u/dba/bin standard location for shell scripts used by the DBA
- /u/dba/apps/prod/"*APPNAME*"/bin
 application shell scripts
- /u/dba/orasop/stndsop
 standard for SQL scripts used by the DBA.
- /u/dba/sql
 location for manually run SQL by the DBA

Resources

- HP Online Documentation
 - <http://www.hp.com/dspp>
- Oracle Online Documentation
 - <http://docs.oracle.com>
- Oracle technology network
 - <http://otn.oracle.com>
- Oracle support site
 - <http://metalink.oracle.com>
- HP/Oracle competence center
 - <http://www.hporaclectc.com/cug/index.html>
- Oracle on Linux FAQs
 - http://www.oracle.com/partnerships/hw/redhat/linux_techsupp_faq.html
- Oracle RH Support
 - http://www.oracle.com/partnerships/hw/redhat/index.html?redhat_support.html

Summary

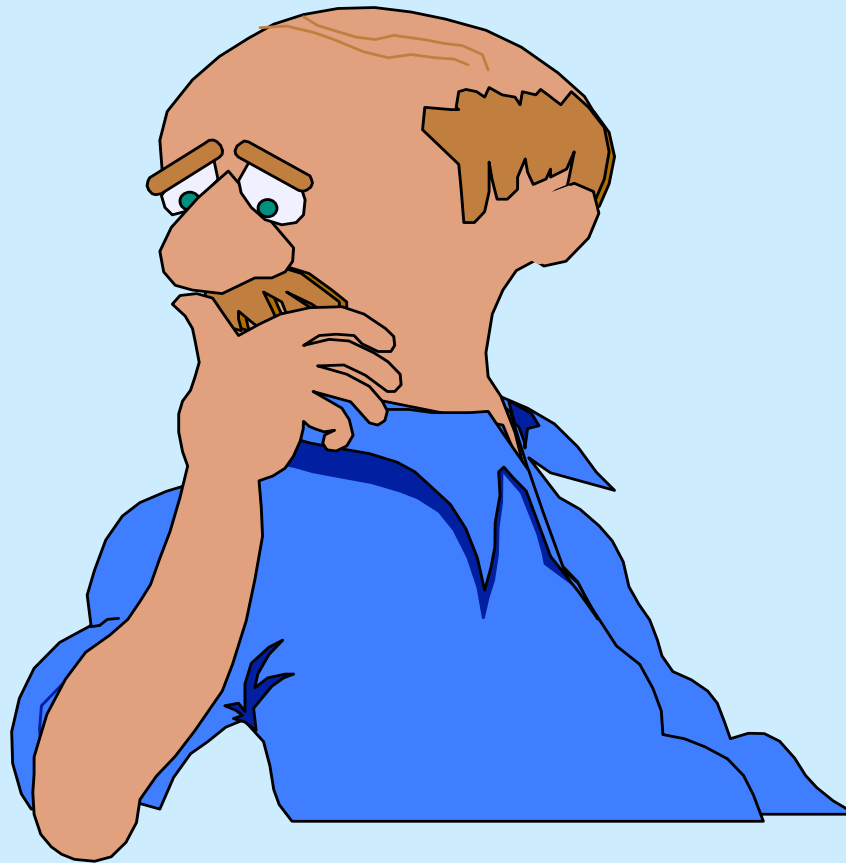
- When does Oracle DBA need a Unix System Admin
- Over view of Oracle environment
- Oracle on HP-UX and Linux
- Monitoring Oracle
- Oracle commands and Utilities
- Shell Scripting



Tips and techniques to support Oracle database

- Resources
- Summary

Questions ???



“I don't understand why people are
frightened of new ideas. I'm frightened
of the old ones.”

John Cage



Special Thanks

Special thanks to

- Behrad Talebzadeh, IT Director, ZLB Behring
- Jesse Crew, Sr. Manager, ZLB Behring
- Nanak Sawlani, Sr. DBA, ZLB Behring

Thank you

Neither ZLB Behring or the author guarantee this document to be error-free. Please provide comments / questions to

Contact:

Kapil.Taneja@zlbbehring.com

HP WORLD 2004

Solutions and Technology Conference & Expo

Co-produced by:

