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Administrating and Supporting ORACLE7 For A/UX - Part 2 (10/93)

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TOPIC -----

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This is part 2 of 2, of an Oracle technical note on Administrating and Supporting ORACLE7 for A/UX. To find part 1 or 2, search for an article titled, "Administrating and Supporting ORACLE7 For A/UX - Part 1 (10/93)."

DISCUSSION -----

Tips For Administrating and Supporting ORACLE7 For A/UX Desktop
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File Management

- ls ls gives a listing of the files in the current directory.

 ls -lF gives a useful long listing, and places a '/' after the name of each directory, and a '*' after each executable program.

 ls -a lists all files, including files that begin with the "."
- cd cd changes the current directory.

 'cd /' changes the active directory to the root of the filesystem.

 'cd ..' changes to the parent directory of the current directory.
- pwd pwd tells you what directory you are accessing.

mkdir 'mkdir new_directory' makes a new directory called 'new_directory'

cp cp is the command to copy a file to a new file.

'cp -r' is a recursive copy, which can copy directories and their contents.

mv mv is the command to move or rename a file. mv is not capable of moving a file from one filesystem to another.

chmod chmod <new permissions> <some_file> changes the permission bits on a file. chmod is often used to either restrict access to a file, or to enable the 'setuid bit' on an executable program.

A file has certain permission bits, which determine the rights to read, write, and execute the file. These permissions are given differently to the owner of the file, the group to which the file belongs, and everyone else.

ls -l will give a full listing of files, and the left-most column is a listing of permission bits.

```
-rwxr-xr-x 1 oracle dba 4122655 Jun 19 14:19 sqldb*
```

There are a total of 10 characters in the left column.

The first character is '-' for a file, and 'd' if the item is a directory.

The next 9 characters are 3 groups of 3 characters each. Each group determines the rights to read, write, and execute.

rwx means that read, write, and execute rights are enabled
r-x means that read and execute are enabled, but writing is not.

If the letter is present in a particular position, the right is enabled. If there is a '-', the permission is disabled.

The first group of letters corresponds to the rights granted to the owner of the file. The userid listed in the third column of the ls -l output is the owner of the file.

```
** If the owner's permissions are 'rws', then the setuid bit  
** is set, meaning that the program will run with all of the  
** rights as the owner of the program, regardless of who  
** invokes the program.
```

The second group of letters corresponds to the rights of the group to which the file corresponds, which is the fourth parameter of the ls -l output.

The third group of letters defines the permissions for everybody.

`-rwxr-xr-x` means that everyone can read and execute the file, but only the owner can write (modify) it.

`-rwsr-x---` means that the setuid bit is enabled, people in the group which owns the file may read and execute the file, but people outside of the group have no access to the program.

To set the permissions, you need to assemble a string of 3 numbers to tell `chmod` how to set the permissions. Different privileges are enabled by adding up the numbers below:

```
read -    4
write -   2
execute - 1
```

read and execute privilege (4 + 1) are 5
read, write, and execute (4 + 2 + 1) are 7
to set the setuid bit, you prefix your string with the number 4.

```
chmod 755 (yields -rwxr-xr-x)
chmod 400 (yields -r-----)
chmod 4755 (yields -rwsr-xr-x) (The setuid bit is enabled)
```

The files 'orasrv' and 'oracle' (which are located in the /users/oracle/bin) should be `-rwsr-xr-x`. You can set these permissions with the command:

```
chmod 4755 orasrv oracle
```

chown `chown <new_owner> <some_file>` changes the ownership of `<some_file>` to be owned by `<new_owner>`. Only the current owner or the superuser (root) may issue this command.

Only the owner and the superuser (root) may delete a file. the ownership of a file is usually most important with executable files that have the setuid bit set (see `chmod` above).

```
*** Note: when you change the ownership of a file, the
***       permission bits can be changed. You may need to use
***       the chmod command to get the proper setting.
```

chgrp `chgrp <new_group> <some_file>` changes the group ownership of `<some_file>` to be owned by `<new_group>`. Only the current owner or the superuser (root) may issue this command.

find `find` can be used to locate files, and perform an action on each

of them if desired.

```
find . -exec ls -l {} \;
```

This command looks a bit confusing, but it gives a long listing of the files in the current directory, as well as all of the subdirectories. Check the manual pages on find for more detailed information.

tar creates archives and extracts data from them.

```
tar -cf archive.tar something
  (creates a new archive called 'archive.tar' containing a copy
  of 'something'. Something could be a file, or a filesystem)
```

```
** Note: NEVER try to back up a database that is RUNNING.
**      copies of running databases WILL NOT WORK.
```

```
tar -xf archive.tar
  (extracts the contents of archive.tar into the current
  directory)
```

compress 'compress some_file' will create a compressed version of the file called some_file.Z, and deletes some_file. You must uncompress the some_file.Z before using it again.

Filesystem Management

If you are not familiar with filesystems, mounting of filesystems, or disk setup in general on A/UX 3.0.1, please refer to the "Disk Setup" section of Bulletin #103947.028 -- "Setting up an AWS 95 Server for ORACLE7 for A/UX".

df -B df will give you a line of information for each of the mounted filesystems. Note the capital letter 'B', which specifies that the results should be given in kilobytes.

```
df -B
Filesystem      kbytes   used   avail %used  Mounted on
/dev/dsk/c0d0s0 140519 125637   7856   94%   /
/dev/dsk/c300d0s 637015 523524  81640   87%  /u1
/dev/dsk/c401d0s 1122889 805559 261185   76%  /u2
```

This command tells you which filesystems were successfully mounted, where they are mounted, how big they are, and how much space is available on each of them.

```
** Notice that the 'Filesystem' column is not giving you the
** first 16 letters in the name of the disk device file. If
** you need the full name, check the /etc/fstab file, or use
** the df command without the -B flag.
```

/etc/fstab the fstab file has one line for each filesystem which should be

mounted. It specifies the type of filesystem, where to mount it, and on what device it resides.

```
# fstab for Squid 6/23/93
#
/dev/dsk/c300d0s0      /          ignore  rw      1 0
/dev/dsk/c300d0s2      /u1        4.2     rw      1 0
/dev/dsk/c401d0s2      /u2        4.2     rw      1 0
```

The lines that begin with # are ignored. It is a good idea to put notes in this file that identify which machine it belongs to, and when it was last modified. Whenever you modify this file, you should PRINT it and put it somewhere safe.

```
*** IMPORTANT:  having a printout of the fstab file is very
***              helpful if your machine has a damaged root
***              partition, and you need to remember where all of
***              your filesystems reside. You need to know the
***              location of your root filesystem.
***              /dev/dsk/c300d0s0 is the default, but it may be
***              different on your system.
```

```
*** I like to tape a printout of this file to the machine.
```

fsck

fsck checks filesystem consistency and interactively repairs the filesystem. If a filesystem will not mount, you need to run fsck on it to verify and fix it. fsck works on a disk device file that corresponds to the filesystem in question. If the filesystem which normally mounts fine on u1 is not mounting, I need to run fsck. I can't just run 'fsck u1'. I need to run fsck on the disk device file that was listed in the /etc/fstab file that corresponds to the problematic filesystem.

```
squid.root # fsck /dev/dsk/c300d0s2
** /dev/dsk/c300d0s2
** Last Mounted on /u1
** Phase 1 - Check Blocks and Sizes
** Phase 2 - Check Pathnames
** Phase 3 - Check Connectivity
** Phase 4 - Check Reference Counts
** Phase 5 - Check Cyl groups
FILE SYSTEM STATE IS MARKED AS DIRTY
FIX?
```

When you find out "FILE SYSTEM STATE IS MARKED AS DIRTY", you do NOT ALWAYS want to fix that.

```
** If the filesystem is currently mounted ( it shows up when
you use the df command), it will be DIRTY, which is OK.
Filesystems are dirty when there is data in buffers that
has not been written out to disk, which is fine if the
filesystem is mounted and in use. If this is the case,
choose N.
```

** If the filesystem is not mounted (it does not show up when you use the df command) then you should choose Y.

If an Oracle database (or some other program) is writing to a file on a filesystem at the time a server goes down (crashes), then the filesystem will not mount when the server comes back up. You need to run fsck to repair the dirty filesystem.

If the dirty filesystem is the root (/) filesystem, then A/UX will not boot. The A/UX Startup program will tell you that the root filesystem (/dev/dsk/c0d0s0) is dirty, and will present you with a window in which you can issue some UNIX commands. Try:

```
fsck /dev/dsk/c300d0s0
```

Once fsck completes the repairs on the filesystem, you should be able to type the command 'boot' to start A/UX.

mount -a mount -a will attempt to mount every filesystem listed in the /etc/fstab file. If mount -a returns no information, that means that it had no problem. If it gives you errors, that means that either the /etc/fstab file is not set up properly, or the filesystem is damaged and should be checked with fsck.

mount -a is automatically called at startup time. You should only need to use this command after modifying the /etc/fstab file or after repairing a filesystem with fsck.

Unix Shells

.login The .login file is in the home directory of each user. The .login file contains commands which are executed automatically when the user logs in to the UNIX machine.

It is often helpful to set the following in the .login file:

```
setenv ORACLE_HOME /users/oracle
setenv ORACLE_SID  SAMP
setenv PATH        "/users/oracle/bin:/bin:/usr/bin:/usr/ucb:
                  /mac/bin:/etc:/usr/etc:/usr/local/bin"
```

Adding these lines to the .login file will set these variables automatically when you next login, or use the source command.

PATH PATH is the environment variable which lists the directories on the UNIX machine that will be searched when a command is typed. If I type 'do_something', and there is no program called 'do_something' in the current directory, the shell will search all the directories listed in the PATH for an executable program called 'do_something'. A default PATH may look like:

```
PATH=:/bin:/usr/bin:/usr/ucb:/mac/bin:/etc:/usr/etc:/usr/local
/bin
```

If you try to use the oracle program called 'sqlldb' you will see:

```
sqlldb
sqlldb: Command not found.
```

If you want to be able to use Oracle commands, you should add the bin directory of the oracle home to the PATH. This is '/users/oracle/bin' by default. Then the PATH would look like:

```
PATH=:/bin:/usr/bin:/usr/ucb:/mac/bin:/etc:/usr/etc:/usr/local
/bin:/users/oracle/bin
```

In this case, the PATH references /users/oracle/bin, so the sqlldb command can be used without problem.

cssh is the C shell, which is the default shell for each user except root. Use the setenv command to set environment variables. when running the C shell. This is also known as /bin/csh.

setenv setenv sets environment variables under csh.

'setenv SOME_VARIABLE some_contents' sets the variable SOME_VARIABLE to be some_contents.

There are 3 environment variables which are important under A/UX. They are ORACLE_HOME, ORACLE_SID, and PATH.

```
ORACLE_HOME = /users/oracle ( This is the directory where the
                           oracle files and executables
                           reside )
ORACLE_SID   = SAMP         ( This is the name of the default
                           database, which is SAMP )
PATH = ../users/oracle/bin.. (discussed in PATH section above)
```

sh sh is the Bourne shell, which is the default user for the root user. This is also known as /bin/sh.

To set an environment variable in the Bourne shell, you can do:

```
SOME_VARIABLE=some_contents; export SOME_VARIABLE
```

It is important to add the '; export SOME_VARIABLE' to the line, as otherwise programs that you run will not be able to evaluate that environment variable.

```
ORACLE_SID=SAMP; export SAMP
```

This sets the ORACLE_SID to be SAMP, and allows other programs you run (like Oracle utilities) to read the variable.

env env lists the names and contents of all variables in the current shell's environment.

source source is used to read in a configuration file. If you edit the .login file, and want the changes to take effect, you can log out and log in again, or read in the file. To read in the .login:

```
source .login
```

This will run all of the commands in the .login file.

Oracle Database Management

tcpctl tcpctl is a command to help you start, stop, and get the status of the SQL*Net TCP/IP version 1 listener.

** 'tcpctl status' should give you the status of orasrv.

```
tcpctl status
tcpctl: Status summary follows
Server is running:
  Started           : 8-SEP-93 12:08:51
  Last connection  : 15-SEP-93 11:09:17
  Total connections : 87
  Total rejections : 3
  Active subprocesses : 9
  ORACLE SIDs      : S6A,S6B,S6C,S7F,SAMP
  Default SID      : (null)
Logging mode is ENABLED.
DBA logins are DISABLED.
OPSS$ logins are ENABLED.
OPSS$ROOT logins are DISABLED.
Orasrv is detached from the terminal.
Break mode = IN BAND.
Debug level = 1
No timeout (on orasrv handshaking).
Length of listen queue = 10
Orasrv logfile = /u2/7012f/tcp/log/orasrv.log
Orasrv mapfile = /etc/oratab
```

This tells you that the server is running, and has been running for a week. It has serviced 87 connections since it was started, and there are currently 9 connections made to the server. The active SIDs were read in from the /etc/oratab file.

If the server is not running, it will look like:

```
tcpctl status
tcpctl: server is not running: Connection refused
```

** 'tcpctl start' should start the TCP/IP listener process (orasrv).

```
tcpctl start
tcpctl: log file is /u2/7012f/tcp/log/orasrv.log
tcpctl: SID mapping file is /etc/oratab
tcpctl: server will be run under oracle
tcpctl: logging mode is on
```

```
orasrv: Release 1.2.7.5.1 - Production on Wed Sep 15 12:01:06
1993
```

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```
Starting server on port 1525.
tcpctl: server has been started
```

This means that server was successfully started on port 1525 (which was read in from the /orasrv entry of the etc/services file).

You may get the following error if you try to issue the 'tcpctl start' immediately after issuing a 'tcpctl stop':

```
Starting server on port 1525.
orasrv: server already running: Address already in use
```

If this happens, wait a few minutes and try again, while the UNIX operating system releases the port.

** 'tcpctl stop' should stop the TCP/IP listener process (orasrv).

'tcpctl stop' requires that you log into the A/UX machine as the user who started the server. You must actually log into the machine or telnet to the machine to have the proper privileges. If I log in as a user who is not a dba, and use the 'su - oracle' command to become the oracle user, it will not work:

```
tcpctl stop
tcpctl: checking user permission...
tcpctl: permission denied
```

If I then telnet to this machine as oracle, or log out and log in as oracle, it will work:

```
tcpctl stop
tcpctl: checking user permission...
```

tcputl: server has been stopped

You can also stop the orasrv process by killing it.

```
ps -ef | grep orasrv (this finds the orasrv process...)
oracle 692      1 0 Sep 21 ?          0:02 orasrv
vgrigori 16358 15344 2 18:17:44 p2      0:00 grep orasrv
```

kill 692 (This kills the orasrv process.)

orasrv orasrv is the SQL*Net TCP/IP version 1 listener process which is controlled by the tcpctl program.

atksrv atksrv is the SQL*Net AppleTalk version 1 listener process. It is invoked with the command atksrv.

atksrv Squid

atksrv: Release 1.0.1.2.1 - Production on Wed Sep 15 12:38:06 1993

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Server name is Squid

Server Squid[10790] is accepting connections....

- * If you get the error: Cannot register service "Squid" on network, that means that there is an AppleTalk listener using that name already in your zone of the AppleTalk network.

The [10790] tells you the PID of the atksrv process. You can stop the atksrv listener by hitting control-C, or by killing the process manually from another UNIX prompt.

You could also kill the atksrv process in the same way you could kill the orasrv process, which is described in the tcpctl section.

sqldba sqldba is the utility used to administrate the Oracle database. It can create, startup, and shutdown databases. If the database is not running, you can only connect to it by using 'connect internal'. Once connected internally, you may startup and shutdown the database.

sqldba

SQL*DBA: Release 7.0.12.2.0 - Production on Wed Sep 15 12:44:56

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ORACLE7 Server Release 7.0.12.2.0 - Production

With the procedural and distributed options
PL/SQL Release 2.0.14.0.1

```
SQLDBA> connect system/manager
ORA-01034: ORACLE not available
ORA-07318: smsget: open error when opening sgadef.dbf file.
Macintosh A/UX Error: 2: No such file or directory
```

The above error occurs when the database is not running. If you are logged in as a user in the dba group, you may connect internally and startup the database.

```
SQLDBA> connect internal
Connected.
SQLDBA> startup
ORACLE instance started.
Database mounted.
Database opened.
Total System Global Area          7319428 bytes
      Fixed Size                   30492 bytes
      Variable Size                6453352 bytes
Database Buffers                   819200 bytes
Redo Buffers                       16384 bytes
```

After starting up the database, you may connect as a database user.

```
SQLDBA> connect scott/tiger
Connected.
```

You could then connect internally and shutdown the database.

```
SQLDBA> connect internal
Connected.
SQLDBA> shutdown
Database closed.
Database dismounted.
ORACLE instance shut down.
```

Loopback

You could then attempt a TCP/IP connection to the database (provided you have started the orasrv process). This is called a loopback, as the server machine is making a connection to itself, which is a useful test of the server's functionality.

```
SQLDBA> connect scott/tiger@t:squid:S7F
Connected.
```

* You may get errors trying to do the loopback.

ORA-6114 - problem with the SID you specified. Compare the SID you tried with the /etc/oratab file.

ORA-6401 - you did not install SQL*Net TCP/IP.

- ORA-3113 - you probably did not install the C programming option of A/UX and oracle was not properly installed.
- ORA-6107 - you need to add the orasrv entry to /etc/services.
- ORA-6105 - you need to add the server's hostname to /etc/hosts
- ORA-6108 - orasrv is not running, or you have the wrong IP address entered for your server in /etc/hosts. Refer to the description of ping above.
- ORA-1034 - orasrv is running properly, but the rdbms is not. Use sqldba to start the database.
- ORA-7318 - This error usually follows ORA-1034, but it means the same thing. The database is not running.

/etc/oratab - This file lists the instances (SID's) available on the A/UX machine. The has one line per database on the machine. Lines beginning with '#' are comments which are ignored. Each line is made up of the format:

SID:ORACLE_HOME:STARTUP

Where: SID is the name of the database
 ORACLE_HOME is where you installed the database
 STARTUP is either Y or N, which indicates whether the dbstart and dbshut utilities should start or stop that database.

The default /etc/oratab should have the line:

SAMP:/users/oracle:N

This means that I have one database on my machine, it is named SAMP, and the ORACLE_HOME for the SAMP database is /users/oracle. The ORA-6114 error occurs if you attempt to connect to a database that is not listed in the oratab file.

*** The capitalization of the SID is important
 *** 'SAMP' is different from 'samp'.

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