

# DEC ALPHA SysAdmin for Mechanical Engineering

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# Chapter 1

## Introduction

This is an internal document for the maintenance and system administration of the DEC ALPHA workstations within the Department of Mechanical Engineering.

These machines are presently apstar1 and apstar2, owned by Dr. Alex Klimenko. A detailed list of the machines, and their respective hardware can be found in the appendix.

# Chapter 2

## System Administration

### 2.1 Adding/Creating a new user

As root, issue the command

```
\usr\tcb\bin\XSysadmin
```

Select

Accounts ⇒ Create User Accounts

For new users;

**UID** If the user has an account on another UNIX machine, such as Mechanical Engineering's moon.mech.uq.edu.au, then this field should be set from the UID used on that machine. Otherwise, it can be left blank, and the operating system will assign a free UID number.

**Primary Group** This is usually set as *users*.

**Secondary Group** Other groups that the user will be sharing files with can be selected here.

### 2.2 Updating/Modifying/Deleting a user

As root, issue the command

```
\usr\tcb\bin\XIsso
```

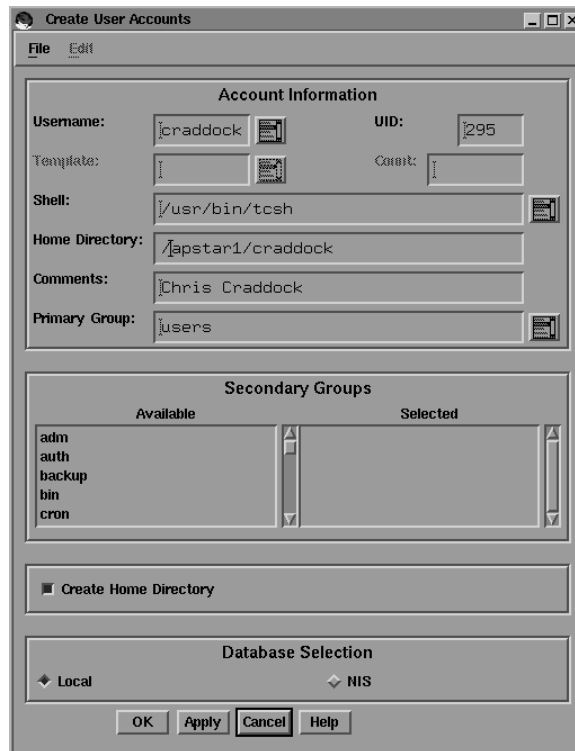


Figure 2.1: XSysAdmin - Create New User

From here, you can select the specified user from the list of present users. After modifying the attributes for a user, select *update* to ensure the changes take place.

To enable a user to have Superuser access (root access), they must have *system* as a secondary group.

## 2.3 Updating a software license

Ensure that the PAK file is available. The PAK file contains information needed by the license manager to enable the license. An example PAK file looks like

```
#-----
# Licence ID:          SNAS5410
# Document ID:         00477118
# DIGITAL Order Ref:  000382252-001-003-0098
# Model ID:            -QSCSU-01
# Component ID:        QL-MV2A9-N9
# Product Name:        DIGITAL FORTRAN DIGITAL UNIX
$lmfcom register - << =EOF=
                    Issuer: DEC
                    Authorization Number: ASP-SN-1999JAN14-13897
```

```

        Product Name: FORTRAN-0
        Producer: DEC
        Number of units: 0
        Key Termination Date: 28-FEB-2000
        Activity Table Code: CONSTANT=100
        Checksum: 2-EFHF-NKGE-MDKG-LFOK
=EOF=
if ($status == 0) then
    echo "FORTRAN-0 successfully registered"
endif
#-----

```

To install this license, as root issue;

```
lmf register - < PAK_file
```

Where *PAK\_file* would be the text file, similar to the example PAK file listed previously.

### Notes

If encountering difficulties in operating the license, check to ensure that it is loaded into the kernel cache. Use the following command to list licences loaded into the kernel;

```
lmf list cache
```

If after installing the licence, you can't see it in the kernel cache, you will have to reset the cache. Also, double check to make sure that the old licence isn't still loaded into the cache. If either of these are the problems, resetting the kernel cache will fix the problem. To do this,

```
lmf reset
```

## 2.4 Mounting the CD-ROM

```
apstar1
```

```
mount -r /dev/rz5c /mnt/cdrom
```

Table 2.1:

apstar1	mount -r /dev/rz5c /mnt/cdrom
apstar2	mount -r /dev/rz4c /mnt/cdrom

### Problems

If the mount point */mnt/cdrom* does not exist, create it using

```
mkdir /mnt/cdrom
```

If unsure which block device is the CD-ROM, issue the command

```
file /dev/rrz*c
```

This command searches all of the SCSI drives installed. Check the output against known disks, for example, the hard disks will already be mounted by the file-system, so check which ones are presently mounted using the

```
mount
```

command. Which ever rz\*c device is left, should be the CD-ROM.

## 2.5 Enabling fast ethernet

While no-one is using the system, enter single user mode (also known as console mode) by issuing the command

```
halt
```

Ethernet devices can be seen on boot up, for apstar2 the following devices are available

```
ewa0_mode BNC  
ewb0_mode Twisted-Pair
```

Note that BNC is the black, older style ethernet cable (10BASE-T), while Twisted-Pair is the blue UTP style fast ethernet cable (100BASE-T).

Issue the command

```
set ewb0_mode FAST
```

This will enable fast ethernet on the ewb0 card.

To exit single user mode

```
init
```

### Notes

Useful commands for debugging the network

```
/usr/sbin/ifconfig tu0  
/usr/sbin/ifconfig tu1  
/usr/sbin/netstat -ina  
/usr/sbin/netstat -r
```

## 2.6 NFS - Importing filesystems

To import a file system, add an entry to */etc/fstab*.

```
nova1.mech.uq.edu.au:/home/nova /home/nova nfs rw,soft
```

This will mount the filesystem */home/nova* from the server machine *nova1.mech.uq.edu.au* at the mount point */home/nova* on *apstar1*. It will be mounted as an *nfs* file (*nfs*), and will have read-write (*rw*) access. It will also be mounted in *soft* mode (*soft*), meaning that if the server (*nova1.mech.uq.edu.au*) fails, then *apstar1* will continue operating.

## 2.7 Installing Digital FORTRAN

On *apstar2*, mount the CD-ROM containing Digital Fortran

```
mount -r /dev/rz4c /mnt/cdrom
```

To check previously installed software, issue

```
cd /  
setld -i | egrep 'F9A|PSESH|DFA'
```

If an old version of Fortran exists, such as *DFARTL361*, it will show up in the previous command. Delete it using

```
setld -d DFARTL361
```

Now install the new Fortran from the CD-ROM. The example here is for Digital Fortran *DFA410*

```
setld -l /mnt/cdrom/dfa410/kit
```

From the options presented by *setld*, you can choose the following

- 2 F77
- 4 F90
- 5 RTL for F77
- 6 RTL for F90

To verify the installation,

```
setld -v DFABASE410
```

To finalise the installation, the license for Digital Fortran must be installed. See 2.3.

## 2.8 Adding new hard-disks to DEC ALPHA

To check the disk status, use the command (example device `/dev/rrz1c`)

```
disklabel -r /dev/rrz1c
```

Descriptions of common hard-disks are kept in the `/etc/disktab` file. If the disk being added is not described in this file, it will be classed *unknown*. You will then have to update the `/etc/disktab` file with the disks characteristics. An updated `/etc/disktab` file can be downloaded from dec, at `/pub/DEC/ulix-disktabs`

To create a new file system, use

```
newfs /dev/rrz1c
```

WARNING: THIS WILL ERASE `/dev/rrz1c`

## 2.9 Installing new packages

New software, especially the free GNU based utilities, can be easily installed. A log is normally kept of which software has been installed, and any other major modifications to the operating system. This file is `/etc/packages_installed`, and is maintained by hand by the system administrator (in other words, updated using vi by yourself). It is a good idea to use it so as to keep track of what was installed when, and what version.

The file `/etc/packages_installed` presently looks like

```
# These are the packages that have been installed / modified on APSTAR2

/usr/bin/tcsh tc sh 6.06
/usr/local/bin/gzip gzip-1.2.4
/usr/local/netscape netscape 3.0
/usr/local/mpi mpi-1.0.14
/usr/local/bin/gcc gcc-2.7.2.2
/usr/local/bin/g77 g77-0.5.20
/usr/local/bin/nedit nedit-5.0 Upgraded on 18/7/97
/usr/local/bin/make gnu make-3.75
/usr/local/bin/bison gnu bison-1.25
/usr/local/sbin/tcpd tcpd-7.5 modified tcp_wrappers with PARANOID off
/usr/local/bin/gdb gdb-4.16 GNU Debugger installed 27/3/97
/usr/bin f77 f90 f95 DEC Fortran v4.10 3/7/97 REMOVED 11/8/97
    Changed DFA4.10 to DFA3.60 due to compiler problems with Alex's DNS code
/usr/bin f77 DEC Fortran v3.60 11/8/97
```

```
/usr/field/UniCensus unicensus unicensus system analysis tool
/usr/local/bin/top top-3.4 top system monitoring tool 20/8/97
/usr/local/perl perl5.004_04 Perl scripting language 13/1/98
fortran-o License updated until 28/2/00
```

## 2.10 rsh - enabling

Ensure that the *inetd* daemon is running.

Modify */etc/inetd.conf* with the following

```
shell stream tcp nowait root /usr/sbin/rshd rshd
```

## 2.11 Swap space

DEC usually ships the operating system with a conservative method of disk swapping. The file */sbin/swapdefault* is usually set to point to the swap disk/partition. If present, the operating system attempts to ensure that every running process is mirrored in the swap space.

This can prove a problem for memory. By removing the */sbin/swapdefault* file, the operating system will drop back to standard swap-space operation. Only using the swap space when memory becomes low.

*/sbin/swapdefault* normally is a symbolic link pointing to the swap space. On apstar1, it can be re-enabled by issuing

```
ln -s /dev/rz0b /sbin/swapdefault
```

Note that */dev/rz0b* is the swap disk here.

It is best to perform this operation in **single user mode**, then re-starting the system to allow the new swap-space handling to take place.

## 2.12 xntp - Enabling synchronisation of the system clock

Ensure that the *xntpd* daemon is installed.

Configure the */etc/ntp.conf* as follows

```

#
# XNTPD Configuration File (template)
#
#
# Specify a filename for the driftfile created by xntpd.
# /etc/ntp.drift is the default.
#
driftfile /etc/ntp.drift
#
#
#
#
# Specify several NTP servers as peers (See the xntpd documentation
# for recommendations on selecting peers).
# NOTE: Be sure to specify version 1 for servers running the ntpd
#       daemon. For example, if server1 runs ntpd and server2 runs
#       xntpd, the two corresponding entries would be:
#
# peer server1 version 1      # ntpd server
# peer server2      # xntpd server
#
#
#
# For further information on configuration options, see the xntpd
# documentation. If you have a local accurate clock (radio clock, etc),
# you will need to specify further configuration options.
#
peer krefti.cc.uq.edu.au
peer star.mech.uq.edu.au
peer nova1.mech.uq.edu.au

```

This will use the mechanical engineering time servers nova1.mech.uq.edu.au and star.mech.uq.edu.au to keep the clock in-sync. It will also query the external UQ time-keeper krefti.cc.uq.edu.au

# Appendix A

## About this document...

This document was written by Andrew Mc.Ghee using  $\LaTeX$ 2e version 3.14159. This is a documentation preparation package written by Donald E. Knuth.

Figures have been drawn using the *xfig* package under UNIX.

XWindows screen captures were achieved using the *xv* package by John Bradley.

Conversion to adobe's PDF format was achieved using the *pstopdf* utility in the ghostscript package. The version of ghostscript used was Aladdin version 5.5. Ghostscript is written chiefly by Peter Deutsch.

# Appendix B

## Unix Commands

Some useful UNIX commands

**cd** - change directory This command is used to change into another directory  
cd .. (Change up one directory)  
cd ~ (or) cd (Change to home directory)  
cd project (change into the project directory)

**pwd** - print working directory Prints the current working directory in full.

**man** - display manual page Used to display detailed information about a UNIX command  
man cd (display information about the cd command)

**mkdir** - make a directory Used to create a new directory  
mkdir project (creates a new directory called project)

**more** - displays a text file, one page at a time more example1.cfg (displays the config file used for example1)

**ls** - list the files in the present directory Similar to the “dir” command in dos.  
ls -alt (Lists files in order of last modified)  
ls -alt — head (Lists last 10 most recently modified files)  
ls -alt — more (Lists files in order of last modified, one page at a time)

**ps** - reports process(es) status Used to display the status of all tasks presently running under the operating system.  
ls -aux (shows all processes for the user)  
ls -aux — grep mcghee (Shows all processes related to ”mcghee”)

**kill** - terminate a process Used to stop a process from running. The process ID is required, and can be found using the *ps* command.  
kill 1324 (kills process 1324)

kill -HUP 1324 (Issues a hang-up to process 1324. Used to restart a process)  
kill -9 1324 (Issues a non-ignorable kill command. Process 1324 cannot ignore this, and will be killed)

**top** - displays top CPU processes Useful interactive process to display the current status of processes running.

**ftp** - File Transfer Protocol Allows transfer of files between computers connected via a network.

ftp student.uq.edu.au (Opens an ftp connection from present machine TO student.uq.edu.au; Files can now be *put* onto student.uq.edu.au or retrieved using *get*. Care must be taken, as binary files must be transferred in *binary* mode.

**vi** - visual editor Standard text editor under UNIX. Operates very differently to DOS and WINDOWS based text editors, so beware. Takes a long time to master, see man page and ask system admin for helpful documents on using vi.

vi example1.cfg (edit the config file example1.cfg)

## B.1 Email

To send text documents to an email address, use the following command;

```
mail fred@student.uq.edu.au < data.txt
```

If you need to send a file that is not text, that is a *binary* file such as a picture, you need to encode the document first, before sending it.

```
uuencode picture.gif | mail fred@student.uq.edu.au
```

For encoded files, when fred recieves the above email, he will have to decode it using *uudecode* or an un-encoder built into his email software. Most common email software can do this un-decoding automatically.

# Appendix C

## Troubleshooting

### Problem

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