ASIAA computers users' guide
Version 2.0

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Chapter 1

User's guide

1.1 Introduction: read it!

1.1.1 What is this document?

This document has two aims:

1. A concise but precise and regularly updated description of the computing resources at ASIAA: chapter 1.
2. A list of many useful things and tricks to solve your problems and save your time: chapter 2.

This document is maintained for the users by the users. It will grow gradually from the contributions of everyone. That means: everytime you have a problem and you find something useful which is not in this guide, or each time you find a good "trick", please send a notification to the people who maintain this document

In any case, this document is not an extensive and general presentation of everything.

A HTML version of this document is also available on line.

This document assumes that the user has already some familiarity with UNIX. If not, please go to section 1.6.

1.1.2 How to get some help

1. Read this document.
2. Try the on-line help: `man -k` *keyword* or `whatis` *keyword*. Many software have good on-line help. Try them.
3. Look at the different documents in the computer room. Please do not take any of these documents outside the computer room.

4. When items 1, 2 and 3 have failed (and only then), ask the help of someone else.

When you meet a problem which seems to be of computer origin, for instance any hardware problem, or some wrong installation, contact the system managers (`mpc@asiaa.sinica.edu.tw`, `cschen@asiaa.sinica.edu.tw`, `tmzou@asiaa.sinica.edu.tw`) with the *detailed* and *exact* list of what you have done and of the messages you received.

If we get email simply saying "My workstaion has a problem", this wo'nt help us much to understand your problem. so be as specific as you can thus we can get down to it quickly.

Note: PC users: please tell us your needs so related information could be shared. Simply complaining behind and wo'nt let us know will never solve your problem. But please be patient if we are busy on urgent tasks like network or email system. All your requests will be answered. (if the request is within our budgetary constraint)

1.2 List of ASIAA hardware resources

List of workstations, PCs, disk space.

1. We now have, as of July 10, 2002, iaa1(alias iaa), iaa3, iaa5, iaa7(SGI Indy), iaa11, iaa15, iaa17, iaa21, iaa23, iaa25, iaa29, iaa31, iaa33 ,iaa35, blade1, blade2, blade2, blade4, blade5. The iaa1 is the main file server, which exports its /asiaa file system to the rest of workstations and all Linux hosts. We have 60 or so PC's and 3 Mac's for office and research usage.
2. The iaa1 file server has about 230 GB disk space for everybody to use. But please do *not* abuse it by storing big files there for months. You can use du -sk directory name to check the disk space you use on that directory(in kbytes).
3. We have public workstaions blade1, blade2, blade4, blade5, iaa31 ,iaa33 and iaa35 in the Computer Room. Each workstaion has 30 to 48 GB external HD. Talk to Frank Chen if you want to researve the disk space.
4. We have one Umax 4800 dpi Umax scanner in the Computer Room . Please put your personal data in

   ```
   e:\00user or d:\00user
   ```

5. If you like to install the PC printer interface yourself, please check /etc/hosts on iaa1 for the IP addresses of our printers. The HP driver will automatically detect our printers through Network Neighborhood once it is correctly

installed. It can be downloaded from www.hp.com. See Tony Zou or Frank if you need assistance.

1.3 Network configuration inside IAA

1.3.1 UNIX world

Some basics:

- How to know the name of the machine I am logged on? Under the UNIX prompt, type `hostname`.
- How to get the IP number of a machine? type nslookup machine_name.
- How to know the name of the display? type echo $DISPLAY under the UNIX prompt. This is useful when you want to display a remote xterm on your local X server.

1.3.2 PCs

- two public PCs are in Rm 718 with MSoffice and image processing software.

1.4 Remote connections

- The IAA has 2 class C IP addresses. 140.109.177.x and 140.109.176.x. Both are controlled by a ASCC router which then pass our network traffic to the AS NGI link with 20 Mb/sec bandwidth. The link between the IAA and NTU computer center is 100 Mb/sec.

1.5 Safety rules

How to change password? Type yppasswd under the UNIX prompt to change your NIS password. We back up every user's home directory and all files under /asiaa. The backup is performed daily using a ASDM clinet software which talks to the server side of a IBM mega storage machine. Users can also back up their data to CDs using the CD-writer in Rm 718.

A description for how to use **tar** will be in section 2.1.1.

1.6 Some basics and important tools

This guide is not an introductory guide to UNIX. If you do not know anything about the UNIX operating system, you should read some tutorials. Introductory references we have in the computer room are: *Understanding UNIX* by Stan Kelly-Bootle, Sybex Ed. and *Student Guide to UNIX* by Harley Hagn, McGraw-Hill Co.

The more advanced UNIX user will have to write shell scripts, for instance to reduce BIMA data. A good reference is: *The UNIX C-shell field guide* by Gail and Paul Anderson, the Southeast book company Ed.

O'Reilly & Associates, Inc publishes a book on csh/tcsh, one on bash, one for ksh . Interested parties are welcome to purchase them to automate your daily job.

1.6.1 How to modify `.cshrc` and `.login` files

Each new user will have tcsh as their default shell, unless otherwise stated. A template .cshrc file is copied to each new user's account for the necesary software/compiler/library paths.(if you cannot find one, please contact Frank Chen)

You can use any editor(vi, emacs, joe, etc) to modify the content of your .login or .cshrc file. The .cshrc file is excecuted each time a new shell is invoked, while .login is only when you login to the machine.

1.6.2 Printing

UNIX printing

SUN Solaris printing is said to be compatible with BSD/SUNOS, but it has its own new commands. for example, lpq is replaced by lpstat, lpr by lp, and cancel replaces lprm. We urge our users to use the new ones as sometimes the old commands will not work perfectly.

Please put the default paper tray back in when you are done with printing.

type lpstat -d to see your default printer. type lpstat -t to see how many printers are available on one machine. use lp filename or lpr filename for printing to hp9k_718 To cancel a print job, type cancel jobid-userid. (lprm may not work perfectly in some cases)

for instance:

```
de5:/asiaa/home/mpc% lp -d hp4k_718 /etc/hosts
request id is hp4k_718-147 (1 file)
blade5:/asiaa/home/mpc% lpstat -t
scheduler is running
system default destination: hp9k_718
```

```
system for hp9k_718: printserver
system for _default: printserver (as printer hp9k_718)
system for hp4k_718: printserver
system for tek740: printserver
system for eps1290: printserver
hp9k_718 accepting requests since Jul 10 14:34 2002
_default accepting requests since Jul 10 14:34 2002
hp4k_718 accepting requests since Jul 10 14:34 2002
tek740 accepting requests since Jul 10 14:34 2002
eps1290 accepting requests since Jul 10 14:34 2002
printer hp9k_718 unknown state. enabled since Jul 10 14:34 2002. available.
printer _default unknown state. enabled since Jul 10 14:34 2002. available.
printer hp4k_718 unknown state. enabled since Jul 10 14:34 2002. available.
printer tek740 unknown state. enabled since Jul 10 14:34 2002. available.
printer eps1290 unknown state. enabled since Jul 10 14:34 2002. available.
```

PC printing All our laser/color printers are networked, which means they can be accessed from your office PC. If you want to install the printer yourself on your PC, get yourself a copy of the driver(eg, www.hp.com) and check the related IP addresses on iaa1 /etc/hosts file. Do'nt dump your print job to the wrong printer for it may cause malfunction or paper jam.

1.6.3 FTP: transferring files

Anonymous ftp. How to access the anonymous ftp area at IAA?

We have set up smart.asiaa.sinica.edu.tw machine as the anonymous ftp machine(Wu ftpd 2.4.2). A typical session looks like the following:

```
iaa1:/asiaa/home/mpc% ftp smart
Connected to smart.
220 smart FTP server (Version wu-2.4.2-academ[BETA-14](1) Wed Sep 24 21:06:48 CST 1997
ready.
Name (smart:mpc): ftp
331 Guest login ok, send your complete e-mail address as password.
Password:
230 Guest login ok, access restrictions apply.
ftp> cd pub
250 CWD command successful.
ftp> dir
200 PORT command successful.
```

```
150 Opening ASCII mode data connection for /bin/ls.
total 34
drwxrwxrwx  16 ftp other      512 May  5 09:10 .
drwxr-xr-x   7 root other      512 Sep 25  1997 ..
-rw-r--r--   1 mpc iaa      154 Oct  3  1997 .message
drwxr-xr-x   2 ftp ftp      512 May 11 03:16 UPLOAD
drwxr-xr-x   2 clw iaa      512 Sep 25  1997 clw
drwxr-xr-x   3 einmann iaa      512 May  5 09:22 einmann
drwxr-xr-x   2 ftp ftp      512 Jan 31 03:41 hwang
drwxr-xr-x   2 hwang iaa      512 Feb 11 08:30 hwang2
drwxr-xr-x   2 kuan iaa      512 Apr  9 05:56 kuan
drwxr-xr-x   2 kyl iaa      512 Mar 26 07:01 kyl
drwxr-xr-x   2 mpc iaa      512 Apr 23 08:43 mpc
drwxr-xr-x   3 ftp ftp      512 May 16 20:12 ohashi
drwxr-xr-x   2 panis iaa      512 Mar 20 09:58 panis
drwxr-xr-x   2 swlee iaa      512 Feb 12 01:43 swl
drwxr-xr-x   2 ftp ftp      512 Feb 11 08:34 swlee
drwxr-xr-x   3 ftp ftp      512 Dec 11 06:50 web
drwxr-xr-x   2 ftp ftp     1024 Mar  4 00:51 zshen
226 Transfer complete.
1037 bytes received in 0.19 seconds (5.4 Kbytes/s)
ftp> cd UPLOAD
250 CWD command successful.
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 289178
drwxr-xr-x   2 ftp ftp      512 May 11 03:16 .
drwxrwxrwx  16 ftp other      512 May  5 09:10 ..
-rw-r--r--   1 ftp ftp  16796160 Mar 26 05:53 6CM.FITS
-rw-r--r--   1 ftp ftp   276730 Mar 25 22:08 arp244.ps.gz
-rw-r--r--   1 ftp ftp  52561920 Mar 25 21:37 arp55.images.tar
-rw-r--r--   1 ftp ftp  18045983 May 11 02:46 cp32e404.exe
-rw-r--r--   1 ftp ftp  2348774 May 11 02:48 dj391en.exe
-rw-r--r--   1 ftp ftp    84598 May 11 03:16 fon_cde.exe
-rw-r--r--   1 ftp ftp  4497064 May 11 02:47 hpja95en.exe
-rw-r--r--   1 ftp ftp  4024424 May 11 02:47 hpjanten.exe
-rw-r--r--   1 ftp ftp  48369152 Mar 25 23:23 ugc2369.images
-rw-r--r--   1 ftp ftp   875602 May 11 02:46 ws_ftp95.exe
226 Transfer complete.
813 bytes received in 0.073 seconds (11 Kbytes/s)
ftp> bin
```

```
200 Type set to I.
ftp> put flex-2.5.4a.tar
200 PORT command successful.
150 Opening BINARY mode data connection for flex-2.5.4a.tar.
226 Transfer complete.
local: flex-2.5.4a.tar remote: flex-2.5.4a.tar
1392640 bytes sent in 1.4 seconds (9.5e+02 Kbytes/s)
ftp> dir
200 PORT command successful.
150 Opening ASCII mode data connection for /bin/ls.
total 291914
drwxr-xr-x   2 ftp ftp      512 May 18 15:15 .
drwxrwxrwx  16 ftp other      512 May  5 09:10 ..
-rw-r--r--   1 ftp ftp  16796160 Mar 26 05:53 6CM.FITS
-rw-r--r--   1 ftp ftp   276730 Mar 25 22:08 arp244.ps.gz
-rw-r--r--   1 ftp ftp  52561920 Mar 25 21:37 arp55.images.tar
-rw-r--r--   1 ftp ftp  18045983 May 11 02:46 cp32e404.exe
-rw-r--r--   1 ftp ftp  2348774 May 11 02:48 dj391en.exe
-rw-r--r--   1 ftp ftp  1392640 May 18 15:15 flex-2.5.4a.tar
-rw-r--r--   1 ftp ftp    84598 May 11 03:16 fon_cde.exe
-rw-r--r--   1 ftp ftp  4497064 May 11 02:47 hpja95en.exe
-rw-r--r--   1 ftp ftp  4024424 May 11 02:47 hpjanten.exe
-rw-r--r--   1 ftp ftp  48369152 Mar 25 23:23 ugc2369.images
-rw-r--r--   1 ftp ftp   875602 May 11 02:46 ws_ftp95.exe
226 Transfer complete.
884 bytes received in 0.063 seconds (14 Kbytes/s)
ftp> bye
221 Goodbye.
iaa1:/asiaa/home/mpc%
```

Users at the IAA with access to the smart machine can create their own direcotry and put/get data there. The method is: first logon to smart, cd to /ftp then make your own directory. This way other people cannot delete them unless it's done by the owner of the files.

1.6.4 Electronic mail

We have a dedicated Linux mail server to handle all incoming mails. Individual workstation is allowed to send mails but all incoming mails are routed to the single mail server. Its major function is to filter out junk mail and virus mail. Relay has been disabled on all hosts.

Email readers: we have mailx, elm, pine, cpine(Chinese pine), mailtool(Open Window), dtmail(CDE), mutt. Please check the manual pages for its usage.

1.7 Resources available at the Academia Sinica computing center

- The ASCC has gate.sinica.edu.tw machine as a general purpose server(Enterprise 5000). You can use mapleV, matlab, Fortran90 on it. Euler machine is a IBM RS6000 computing machine. Pearl is a HP cluster machine(HP 737, 755, kind of old). You need to sign up the HP machine for CPU-intensive job. There is a DEC Alpha 7610, it's alpha.sinica.edu.tw. The best way to find out what the ASCC has to offer is go to AS web page: www.sinica.edu.tw and look for the Computing Center.

1.8 List of software

Here is a brief list of existing software, With the corresponding reference in this guide.

- **AIPS** see 2.3.1.
- **C** language see 2.2.1
- **CLASS**: *Continuum and Line Analysis Single-dish Software*, used by many telescopes: IRAM, CSO... see 2.3.2.
- **FORTRAN** language see 2.2.2.
- **GILDAS** see 2.3.3.
- **GIPSY** see 2.3.4.
- **IDL**: *Interactive Data Language* an excellent software for data processing, display... see 2.2.3.
- **IRAF** see 2.3.5
- **MIRIAD**: data reduction software for BIMA and ATNF, see 2.3.6.
- **TEX** & **LATEX**: the only acceptable text processing software under UNIX: see 2.4.1.
- **UNIPOPS** see 2.3.7
- **WIP** see 2.3.8.
- **XFIG** see 2.5.1.
- **XV** see 2.5.2.

Chapter 2

More about software: FAQ

2.1 UNIX

2.1.1 tar

We currently have two tars available at IAA: the Solaris tar and the GNU tar. There are many other versions of tar for different UNIX systems. Check the respective manual page for the subtleties. Tar is commonly used for tape backup. A typical example is:

```
iaa29:/asiaa/home/mpc/test%tar cvf /dev/rmt/0 .
will backup files under ~mpc/test to the HP DAT tape.

iaa35:/asiaa/home/mpc/test%tar cvf /dev/rmt/1 .
will backup files under ~mpc/test to the Exabyte tape on iaa35.

iaa33:/asiaa/home/mpc/test%tar cvf - . | ssh iaa2 dd of=/dev/rmt/0n

This will backup all files under test directory on iaa33 then store it to a
HP DAT tape drive on iaa2.

iaa2:/asiaa/home/mpc%tar xvf /dev/rmt/0n

This will extract the first tar file on the tape into your home directory.
If you want to extract the third tar file on the tape. Use:

iaa2:/asiaa/home/mpc%mt -f /dev/rmt/0 fsf 2 then run the above extracing
command.(the starting EOF cardinal for the tape is 0)
```

```
iaa35:/iaa350/mpc% tar cvfb  -  20 . | ssh iaa31 dd of=/dev/rmt/0 obs=20b will
backup files on iaa35 to the HP DAT tape on iaa31 through Ethernet.
```

To dump the data from tape to your own workstation is a bit complex, you have to use the following command on one of the machines with a local tape drive connected to it physically:(e.g. tape drive on iaa31)

```
ssh -n iaa31 dd if=/dev/rmt/0 bs=20b | tar xvBfb - 20 file1 file2  if you want
to restore "file1 and file2" to your workstation HD.
```

```
ssh -n iaa31 dd if=/dev/rmt/0 bs=20b | tar xvBfb - 20 will restore all
data on tape to your workstation.
```

2.2 Computing languages

- We have Sun C(cc), Gnu C(gcc), Gnu C++(g++), Sun Cplusplus(c++), Fortran77(f77) , IDL(4-user floating license) as the main languages.

2.2.1 C

We have Sun C(cc), Gnu C(gcc) and Gnu C++(g++). a typical usage is cc -o outfilename filename.c you can use Makefile to simplify your object code compiling.

2.2.2 FORTRAN

We have f77 compiler on every workstation. AS Computing Center has f90 on the gate.sinica.edu.tw machine.

2.2.3 IDL

IDL stands for Interactive Data Language. It is an extremely powerful software for displaying and manipulating data, it is also a complete programming language. It is the language in which more and more astronomical software are written and is becoming a standard, specially in the space astronomy community. There are many introductory manuals and user's guide in the computer room.

To use IDL 5.5 on Linux or Sun you have to "source" /penguin/apps/idl/idl/bin/idl_setup

On Sun Solaris to run IDL5.0 you must put in your `.cshrc` file:

```
   setenv LD_LIBRARY_PATH \
/opt/SUNWspro/SC2.0.1:/opt/SUNWspro/lib:/usr/openwin/lib:/usr/lib:/usr/dt/lib
   setenv LM_LICENSE_FILE \
/opt/SUNWspro/license_dir/sunpro.lic,1:/opt/SUNWspro/SunTech_License/license.dat
   source /asiaa/iaa33/idl/idl/bin/idl_setup
   setenv LM_LICENSE_FILE $IDL_DIR/license.dat
```

Currently, we have 4 floating licenses. So **IDL** can be run from any of the UNIX workstations by up to 4 users at the same time. A single user can have several IDL sessions at the same time. If you cannot start **IDL** because all the licenses are used, you can know who is using **IDL** by:

```
> /asiaa/iaa33/idl/idl_5/bin/lmstat -a
```

Experts: Jeremy, Minho Choi.

2.3 Astronomical software

2.3.1 AIPS

Data reduction software for interferometry, specially the VLA. AIPS is now available on every workstaion with NIS. But please do not run AIPS on the iaa1 file server since it is used by everybody as a general purpose machine. Please run AIPS on the "public" machines like iaa31, iaa35 or iaa33. If you need reserve big chunks of data storage, please see Frank.

Linux users please run AIPS which is installed on linux1 application server. Please see Joshua if you have problems. Linux users can also install AIPS on their own Linux host. This is recommended as our public Sun hosts are short of CPU power and data disks.

to use on Sun Solaris: make an alias in your .cshrc file like this:

```
alias aips 'source /iaa32/aips/LOGIN.CSH; /iaa32/aips/START_AIPS'
```

then you can run aips on any public workstaion.(or your own, if you prefer, see Frank on how to set up your local external HD for data storage). Experts: Jeremy Lim.

2.3.2 CLASS

CLASS is used to process continuum and spectroscopic data from single-dish telescope, for instance from IRAM 30 m or SEST.

Path to access the **GILDAS** package (which **CLASS** is from): `/iaa32/gildas/solaris/bin`. You can add it in your `.cshrc` file, as described in section 1.6.1. You can also do it on-line extending your path with the usual command:

```
> set path= ($path /iaa32/gildas/solaris/bin )
```

There is a good *cookbook* in the manual, in the computer room.

Good trick: have a startup file with many useful definition. Ask the file of one of the "experts".

Experts: Trung

2.3.3 GILDAS

GILDAS is a multi software package from the Grenoble observatory.

Path to access the **GILDAS** package: `/iaa32/gildas/solaris/bin`. You can add it in your `.cshrc` file.

2.3.4 GIPSY

to run gipsy, a user should do as follows.

```
setenv gip_root /iaa33/gipsy
source $gip_root/sys/gipenv.csh
```

gipsy

Expert: Yi-Jehng Kuan

2.3.5 IRAF

An Optical Astronomy software package by NOAO. Be sure to open an xterm then set the TERM variable to xterm under the CL¿ prompt. Do not use dtterm(the terminal you normally use on CDE), IRAF supports no dtterm terminal database.

Create your own login.cl when you first run IRAF by typing cl under the UNIX prompt. There are some tutorials on the NOAO web page. Novice users may like to have a look.

Expert: S.S.King, Andrew Wang

2.3.6 MIRIAD

MIRIAD is the software to use to reduce BIMA and ATNF data. To access it, put in your `.cshrc` file:

```
source /iaa31/miriad_1997/MIRRC.sun4sol
```

There are different way to interface with **MIRIAD**. You can use the MIRIAD interface itself:

```
> miriad
Miriad shell (version 3.0 [05-aug-93])
*** Experimental GNU READLINE installed. ***
A command history file is maintained in $MIRDEF/.miriadhis.
Miriad%
```

Or you can enter command directly from your working shell:

```
> uvlist vis=name options=spectra
```

Or even directly start a shell script:

```
> script_name
```

If you are doing a lot of interactive work, it is probably better to use the MIRIAD interface. Consult the MIRIAD user's guide. Very useful commands are: `inp`, `go`, `unset`.

Experts: Yi-Jehng Kuan, Jeremy Lim.

2.3.7 UNIPOPS

Experts: Yi-Jehng Kuan, Nagayoshi Ohashi.

2.3.8 WIP

Experts: Chorng-Yuan Hwang.

2.4 Text processing

2.4.1 TeX & LaTeX

Put in your `.login` file:

```
setenv TEX /iaa31/TeX
set path= ($path $TEX/bin )
setenv TEXINPUTS  .:$TEX/lib/texmf/tex//
```

It is useful to keep your own definitions in a single separate directory that you can for instance call `texdef`. You can easily make TeX and LaTeX know it by:

```
setenv TEXINPUTS .:$HOME/texdef//:$TEX/lib/texmf/tex//
```

If you need some specific style file please kindly let the system managers know so we can place it for public use.

Use the previewer **xdvi**. Use **dvips** to produce the PostScript output:

`> dvips` *name* : sends directly to the default printer, with letter size format.

Options:

`-t a4` : A4 size format.

`-o` *PSname* : creates a PostScript file of name *PSname*.

2.4.2 Wordperfect

We have currently a single user WP7.0 license. (hint: the WP7 license software cannot tell whether it's used through NFS, so it can be run on different machines simultaneously)

2.4.3 MS word

The usual and only way to master PC software is by experimenting , by playing with it.

2.4.4 Power Point

A popular and powerful presentation software package. Available as part of Windows Office package. We have MS Office installed on every PC.

2.5 Graphics

2.5.1 XFIG

Xfig is Facility for Interactive Generation of figures under X11. It is a menu-driven tool that allows the user to draw and manipulate objects interactively under X Window System.

2.5.2 XV

a very good PD software package. capable of handling various graphics formats, like TIFF, PS, gif, jpeg. Type xv under the UNIX prompt and right click the icon image to bring up the GUI interface.