FAQ - Frequently Asked Questions

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Problems running programs

R-1 program doesn't run or "Command not found"

1. Does the program name correspond to an executable file ?

```
% ls -l progname
-rwxr-xr-x    1 ron      cs         25512 Nov 11  2000 progname
note -rwx
```

If a file has been transferred by ftp execute (x) is switched off. It is necessary to do:

```
% chmod a+x progname
```

2. Does the executable file correspond to a program or shell script?

```
% file progname
progname:    ELF N32 MSB mips-3 dynamic executable (not stripped) MIPS -
version 1
```

This is an executable program. See architecture

```
% file prognam2
```

```
prognam2:      /usr/ill/bin/perl5  script text
Does /bin/perl exist?
% file /usr/ill/bin/perl5
Cannot access /usr/ill/bin/perl5: No such file or directory
```
Check location of appropriate perl5 on current system; can you find /usr/ill etc. Note if the file denotes a particular perl then it is likely the program will only run if that specific perl is found at that location.

R-2 Exec format error. Wrong Architecture

The program was compiled for a different computer system from that where the user is logged on

R-3 Wrong number of arguments

This obscure error is seen when a program is compiled on say *biceps*, a twin processor HP system, and then one tries to run it on a system with a different number of processors. Recompile all components with options for a single processor system.

/sbin/loader can't find shared library...

The program might have been created with a more recent system, and the shared libraries are incompatible. Rebuild program without shared libraries.

R-5 WINDOWS - DOS program not found or fails on file access

When a program has been installed, it or its data use a filename which is too long, or it may have been stored in a sub-directory of say "My Documents". The space in this name creates problems. Place the programs or data in a higher directory e.g. c:\myproj\, c:\mydata

argument list too long

The command includes a wild-card, e.g. * which is translated by the command shell processor, expanding this into filenames. If too many files are present then the space in the standard shell is exceeded. Note: changing directories to the local directory may be faster; it allows, for example, ls to search the directory itself, rather than the shell.

```
e.g.% ls /usr/illdata/data/d17/01773*
/usr/illdata/data/d17/017733  /usr/illdata/data/d17/017737
/usr/illdata/data/d17/017734  /usr/illdata/data/d17/017738
/usr/illdata/data/d17/017735  /usr/illdata/data/d17/017739
/usr/illdata/data/d17/017736
% ls /usr/illdata/data/d17/*
/sbin/ls: Arg list too long.
% cd /usr/illdata/data/d17
% ls *
/sbin/ls: Arg list too long.    (shell is interpreting *)
% ls
017733  018300  018867  019434  020001  020568  021135  021702  022269
022836
```

```
017734  018301  018868  019435  020002  020569  021136  021703  022270
022837
   :
(ls reads directory)

If you simply want to look for holes in the sequence then you
could try the utility written and described in 1995.

is1 14% ls -l /usr/illdata/data/d19
total 400
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_0
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_1
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_2
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_3
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_4
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_5
drwxr-xr-x    2 10348    5190      102400 Oct 15 23:21 d19_6
drwxr-xr-x    2 10348    5190       98304 Oct 23 07:30 d19_7
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_8
drwxr-xr-x    2 10348    5190           6 Sep  4 11:35 d19_9

is1 15% /usr/ill/bin/dirrun /usr/illdata/data/d19/d19_6
 Data in directory /usr/illdata/data/d19/d19_6
 numors 565783 to 569999
 4217 data files are stored here
 Some or all data files have been compressed
```

How do I install my program at ILL?

Unix programs can be compiled on most of the SGI, alpha, Linux, HP systems (see Architecture below). The Scientific Computing group has access to a number of compilers for other packages and systems and can aid users in installing their programs.

P-1 What printers are available on this system ?

The command `% lpstat -a` shows which printers are available. To print a file from the command line then: `% lp -dprintername filename` The printer name corresponds to lj for b/w, otherwise colour, followed by the building number and room number (e=landing).

Why does my computer now reply in French when I print?

Installing a printer on an ILL printer server often leads to loading fresh printer drivers, which are usually French. Go to the printer manufacturers web site, download and install a new version of the driver in English.

P-2 Why are Graphics plots superposed without pagefeeds?

This can arise if unix PostScript output is sent to an Apple printer; the spooler modifies the use of the conventional new-page control "showpage"

P-3 Why can't I use a text data file on a diskette from ILL on my PC?

This can arise when a Macintosh is used to transfer a file from a Unix system to a PC formatted diskette or zip disk. The Macintosh believes it should write a Macintosh text file and terminates each line with a carriage return, as distinct from a linefeed (unix) or returnlinefeed (PC). Use zip on the unix system and ensure the file is transferred in binary form.

P-4 Why does Notepad type out an ILL file across the screen?

The original data file has been copied from a unix system by Explorer, and has made a copy of the unix file without modifying the line endings to the PC standard. Open the file in Wordpad and save as a text file. For a number of files use winftp or ftp to transfer files in text mode. Note: most calculation programs can actually read the unix files directly.

N-1 Why can't I run graphics programs at my home institute ?

The firewall blocks X-window traffic in both directions. A workstation *wines.ill.fr* in ILL19 is attached to the internet outside the firewall and can be used for graphics work.

N-2 Why can't I write to the transfer directory on ftp.ill.fr

It is now only possible to write in the transfer directory when logged on an internal ILL system.

Secure shells have not been implemented at the ILL

M-1 Can I write a log of my X-Window terminal session?

```
either: % telnet 0 -n logfilename        and start new session
or    : % xwsh -log logfilename          SGI, new terminal window
or    : % xterm -l                       logs to XtermLog.xxx (not SGI)
for a single program, terminal output can be copied to a file:
% programrun controls |tee logfilename
```

Architecture

In building and running programs, the hardware, system software, and the user's program must match. One consequence of continuously updating computers is the need to judge whether to sacrifice performance and build more general programs which run on a wide range of systems, or to go for ultimate performance and optimise for a specific target computer, including multi-processor systems. This latter is usually the case for simulation and ab-initio modelling programs, which may be coded and configured for parallel execution.

For the majority of data reduction and conventional treatment having programs which will run on a wide range of systems of different age is an advantage, especially if the binary programs are to be used directly outside the ILL. Using standard program coding with makefiles does simplify rebuilding for specific computers, and other systems, providing that the system differences can be localised in either a few specific routines or libraries.

The following notes point to some features of systems used currently at the ILL, referring to man pages for a more complete description.

SGI-IRIX HP-UX COMPAQ-TRU64(Alpha) Linux WINDOWS

SGI-IRIX

For information " % man ABI". SGI-MIPS has used a number of different processors. For the ILL these range from R4000 to R10000 and R12000, the first being a 32-bit, the last two 64 bit processors. For system version 5.x the default code generated was known as o32, which runs still on all processors. If the user's environment variable SGI_ABI is set to o32 then compilers will build and link to this standard.

All systems at the ILL run under system 6.x; the n64 type of program (often the default on R10000, R12000 systems) will not run on the other cpus, which normally generate _n32 code. Those wishing to generate more general code should set their compiler defaults in their login procedures:

```
setenv COMPILER_DEFAULTS_PATH ~/compiler.defaults
and the file compiler defaults in the home directory contains:
-DEFAULT:abi=n32:proc=r4k:isa=mips3
```

(or the file is invoked always, unless over-ridden in the compile command, if this is placed by a privileged user as
`/etc/compiler.defaults`

Note: n32 programs will not run on v5.x systems.

HP-UX

For information see the f77 etc man pages, which describes the detailed switches for controlling compilation. Note that *biceps* is a machine with two cpus, and normally the compiled code can only be linked to libraries similarly created. The resultant program is only runnable on such systems, e.g. *gold* systems at the ESRF.

COMPAQ-TRU64 (DEC-Alpha)

At the end of 2000 new systems arriving at ILL had System v5.1 installed, which supersedes v4.0x in use elsewhere. Programs built in a standard fashion on the new system use system 5 sharable libraries. These do not exist on version 4 systems, hence the programs fail with a message that /sbin/loader has not found the appropriate library. To avoid this problem it is necessary to build a static program without sharable libraries on the v5 systems, or revert to the v4.x systems for program construction.

Linux

The most common problem occurring with Linux systems is a mismatch between the installed sharable libraries and those the program demands. The command ldd progname will list the required libraries. The names listed are usually linked to one of several in the /usr/lib directories. For RedHat Linux this gives information on the version of library. In the case of SuSe Linux there is often no link, and there is no

version evident. To avoid this problem it is possible to create standalone programs which use no sharable libraries; these are inevitably considerably larger files.

Windows

In the Microsoft world a non-graphics executable runs in a DOS environment under all systems. If a lot of environment variables are used then one can avoid modifying system files like config.sys by invoking a new command shell with an extended environment space within a batch file which then runs the DOS program. The easiest way to do this is to write the batch file with the commands to set the environment variables, then create a shortcut to this file, modifying the properties with the command line in PROGRAM similar to that below:

```
C:\WINDOWS\COMMAND.COM /E:2048 C:\MYPROG\MYBAT.BAT
```

The binary data formats vary between the older Microsoft Fortran (v1-4) and the current COMPAQ Visual Fortran (v5-6.5), but the object files are compatible. A second common development environment is CYGWIN, which uses the gcc compiler and is incompatible with Microsoft objects.

Using graphics the COMPAQ and Microsoft Fortrans have different Fortran libraries, (USE DFLIB, USE MSFLIB respectively) requiring these small code changes; these objects cannot be mixed.