

LIPSOL Installation for LINUX platform under
Ubuntu 9.04

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The present document is intended to be a simple and maybe an empirical guide for installing the Linear programming Interior Point Solver (LIPSOL), specifically under local LINUX Ubuntu Platforms.

- Downloading LIPSOL

LIPSOL is a Matlab-based package for solving linear programming problems through the interior-Point methodology. For computational efficiency it uses a Fortran package by Esmond Ng and Barry Peyton at ORNL to solve large sparse linear systems. For details about LIPSOL visit <http://www.caam.rice.edu/~zhang/lipsol/>.

Currently LIPSOL solvers come for LINUX platforms (the last version is ver 0.60), and also there is a Windows version which apparently does not runs for Matlab ver 7.5 (Matlab2007b) or above because the MEXFILES were compiled under older Matlab versions.

LIPSOL can be downloaded in:

<http://www.caam.rice.edu/~zhang/lipsol/v0.6/lipsol060.tar.gz>

the compressed file can be located for example in `/home/user`.

for decompressing, type:

```
~$ tar -zxvf lipsol060.tar.gz
```

Then if everything goes as it should, you now have a directory “lipsol” in your home.

Now, although the next step would be just typing

“`./Install`” in the `/home/user/lipsol/src` path as it is suggested in the LIPSOL manual, here it is common that some discrepancies appear because of the differences between the the compiler used and the current version of Matlab.

- Setting the Compiler

To overcome the issue above, we need:

1. Download the “gfortran” compiler. It can be obtained through System->Administration->Synaptic (in Ubuntu) and searching for it.

2. Additionally, download the version 4.1 of the gcc compiler:

```
Type: ~$sudo apt-get install gcc-4.1
```

```
Type: ~$mex -setup
```

This instruction is going to require an option, choose: "mexopts.sh".

Open `~/matlab/mexopts.sh` (using emacs, vim, gedit... whatever - sometimes it is under `~/matlab/R2007b/mexopts.sh` - assuming R2007b is your matlab version) and look inside the file for the part corresponding to your architecture; e.g, using Ubuntu 64bit it would need to modify the following three variables:

```
CC = 'gcc-4.1'  
CXX='g++-4.1'  
FC='gfortran'
```

This change must be made in the proper architecture, in this case after the following label:

```
#-----  
;;  
glnxa64)  
#-----
```

And overwrite this "mexopts.sh" file into the LIPSOL directory: `/home/user/lipsol/src`.

3. In the LIPSOL file "Install", set up the variable MATLAB according to the path in which MATLAB is installed. e.g, `MATLAB="/usr/local/matlab"`.

4. In the LIPSOL file "Install", change the following line code:

Instead of:

```
g95 $FCFLAGS mps2mat.f $LIBDIR $XTRFLAGS $LIBFLAGS -L/usr/local/matlab/bin/glnx86
```

put:

```
gfortran $FCFLAGS mps2mat.f $LIBFLAGS -Wl,-rpath,/usr/local/matlab/bin/glnx86/  
-L/usr/local/matlab/bin/glnx86
```

At this moment, we are ready to execute `./Install` in `/home/user/lipsol/src`

- A last change

In order to be able to copy the the whole "lipsol" directory to another path without the necessity of changing again the solver path, we need to modify the

next two LIPSOL files:

```
/home/user/lipsol/solvers/startup.m
```

instead of:

```
LIPSOLPATH = getenv('LIPSOL');
```

put:

```
cd ..  
LIPSOLPATH = pwd;  
cd solvers;
```

```
/home/user/lipsol/solvers/lipcomm/lipconfig.m
```

instead of:

```
liphome = getenv('LIPSOL');
```

put:

```
cd ..  
liphome = pwd;  
cd solvers;
```

- Downloading the Netlib set problems

go to

```
ftp://info.mcs.anl.gov/pub/neos/netlib/MPS/mps.tar.gz
```

and decompress this file in

```
/home/user/lipsol/mpsdir
```

For some reason the actual solver or main program of LIPSOL “miip.m” has a logical link as “lipalg.m”. It is no necessary, so you can just go to lipsol.m and change the following code line:

instead of:

```
[x,y,z,s,w,info] = lipalg(A,b,c,ubounds); % actual solver
```

put:

```
[x,y,z,s,w,info] = miip(A,b,c,ubounds);
```