Installation and Developer Guide for

L_SU,
a graphical user interface
for Seismic Unix (CSM),
under Linux

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1 L_SU Installation

1.1 Tested operating systems

All the installation steps have been tested on new, blank systems and have worked without any errors and are the recommended simplest paths to installing the software.

Particular users have their own specialized software installations and we would like to hear from you if you have any difficulties with the installation (***gllore@lsu.edu***)

We have used the following instructions to install L_SU on Debian system, CentOS7 and Redhat6.9 systems sometimes with a little apprehension but without any ensuing difficulties.

Most installation problems occur (1) if the necessary CPAN modules do not correctly load and (2) more simply, if the environment variables are not properly set.

1.2 Perl

Before any further installation steps you must first have installed the Perl language on your linux box. Most linux-type systems come automatically with the Perl language. You can check to see if you have Perl installed by entering the following command:

```
% perl
```

1.3 Additional Perl freebies

1.3.1 Loading cpan

We recommend that the easiest way to install public Perl modules is by FIRST installing a utility that is written in Perl and known as: **cpan**. You will have to have root privileges, at least temporarily when you install **cpan** and the following modules. Later you will be able to use them in L_SU as a regular user. (cpan downloads from ***https://www.cpan.org/***)

If you are working under CentOS7x, I find it easiest to install cpan as follows:

```
% yum install cpan
```

1.3.2 Loading required Perl Modules

Continue using **cpan** to install the following required modules:

- **MIME::Base64**
- **Config::Simple** (tested with V 4.58 and V 4.59)
- **Shell** (tested with V 0.73)
- **Tk::JFileDialog** (tested with V 1.62)
- **Tk** (tested with V 804.034 a.k.a. PerlTk)
- **Clone** (tested with 0.9943)
- **Tk::Pod** (tested with V 0.9943)
- **Moose** (tested with v 2.2010)

For each of the above packages use the following commands to install each of them:

```
% cpan MIME::Base64
% cpan Config::Simple
% cpan Shell
% cpan Tk::JFileDialog
% cpan Tk
% cpan Clone
% cpan Tk::Pod
% cpan Moose
```

1.3.3 Loading Seismic Unix

At present, we recommend that you download Seismic Unix and install the program as per the instructions contained within:

```
% wget http://www.geol.lsu.edu/jlorenzo/downloads/cwp/cwp_su_all_48.tz
```

Or, you can navigate with a web browser to http://www.geol.lsu.edu/jlorenzo and click at the link to "Free Geophysics Software"

1.3.4 Modify file that defines the system variables of your computer work environment

In order for Perl to find all the programs that it needs at run time, it will look in pre-defined areas of your hard drive. These pre-defined directories, whether known to the user or not, exist

on most personal and linux-based operating systems. Your system manager usually adds special file locations as needed. Local users can even override the special file locations although that is not a safe practice.

For example, if I usually place Perl programs under **/usr/local/pl**. Then, in order for all the Perl scripts and other programs to run, I have to add several new lines of instructions within my **.bashrc** file, located in my home directory.

```
# for general perl directories
export LOCAL=/usr/local/pl
export PL=$LOCAL/pl

# for L_SU
export L_SU=$LOCAL/pl
export PERL5LIB=$PL:$L_SU/configs:$L_SU/sunix:$L_SU/unix
export PERL5LIB=$PERL5LIB:$L_SU/gmt:$L_SU/R:$L_SU/big_streams
export PERL5LIB=$PERL5LIB: :$L_SU/messages:$L_SU/misc:$L_SU/reqs
export PERL5LIB=$PERL5LIB: $L_SU/specs:$L_SU/sqlite:$L_SU/streams
export PERL5LIB=$PERL5LIB $L_SU/geopsy:$L_SU/images

# for exectuable L_SU-related Perl scripts, PATH must be defined within your .bashrc file
# somewhere above the current lines
export PATH=$PATH:$L_SU
export PATH $PATH:$L_SU/big_streams

# for Seismic Unix
export CWPROOT=$LOCAL/cwp_su_all_48
```

Please note that **CWPROOT** is a directory path where the C programs that belong to Seismic Unix are usually installed.

If you do not have permission to change your local .bashrc file then ask your systems manager to make some arrangement that will allow your local .bashrc files to pointing to a system-wide file that only the administrator control, in which case you can add the following line to your local .bashrc file:

```
source /PATH/bashrc_system
```

But, you will need to know what 'PATH' is and what 'bashrc_system' is. If this sounds confusing, see your administrator or write to me at gllore@lsu.edu.

1.3.5 Installation of Core L_SU modules for users and developers

All the core Perl programs are available at ***www.github.com/gllore*** and can be installed anywhere you want as long as your operating system knows automatically where they are located (See 1.3.4). If you are reading this file then it means you already know something about downloading files from the github.

1.3.6 Installation of SioSEIS

From the SIOSEIS Website: " SIOSEIS is a software package for enhancing and manipulating marine seismic reflection and refraction data, sponsored by the National Science Foundation (NSF) and the Scripps Industrial Associates. The system currently runs on Mac OSX (PowerPC and Intel) and PCs (Linux and CYGWIN) E-mail phenkart@gmail.com for inquires. Open source can be downloaded from" http://sioseis.ucsd.edu/index.html.

I recommend you read the documentation at this website for many details on this valuable software.

L_SU integrates some of the functionality of SIOSEIS in order to convert data written in a SEG2 format into SU formatted data.

1.3.6.1 Download SIOSEIS

You can use your browser to navigate to that website and download the file or you can directly load it into your folder by the following command:

```
% wget http://sioseis.ucsd.edu/src/sioseis-2016.3.1.tar.bz2
```

After you untar and decompact this software read the README file to learn how to install the programs while using root privileges. Later, when L_SU looks for sioseis you should have the path to the binary defined.

1.3.6.2 Modify system environmental variables

If you use the common bash shell,the **.bashrc** file should contain the following command when **SIOSEIS** is installed under **/usr/local/bin**:

```
export $PATH=$PATH:/usr/local/bin
```

Commonly, bashrc files can contain other general definitions as well to achieve the same result:

```
export LOCAL=/usr/local
```

```
export BIN=$LOCAL/bin
export $PATH=$PATH:$BIN
```

2 For Developers

2.1 How to create a SeismicUnix Perl Module for the GUI

2.2 How to add a complex flow of many SeismiUnix modules into the GUI

2.3 FAQ's

2.4 Perl Modules

2.4.1 Names and function