

DaViT Installation Guide

Version 0.7

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Preface

This installation guide will help you to get DaViT up and running on your computer. It will help you if and only if you run some flavor of Linux – if you’re planning to use DaViT in conjunction with any other operating system, this guide may still provide the rough outline of which steps to take, the details of which, however, you will need to find out yourself. Most of what you need to do in order to install DaViT will occur on the command line, the commands used here of for the `bash`. You should have some basic understanding of Linux commands. The symbol `↵` appears to indicate that the command continues without a linebreak in the next line.

DaViT comes packaged with the Radar Software Toolkit (RST). This toolkit provides software functionality written mostly by Rob Barnes at APL in C for reading, writing, and plotting SuperDARN radar data. DaViT itself is written mostly in IDL but for faster reading of radar data it uses parts of the RST. Therefore, before you can use DaViT, you need to install the RST on the computer on which you will also run DaViT. The first part of this guide will guide you through the compilation process of the RST, the second part will help you install DaViT, and the last part will give a brief introduction into the capabilities of DaViT.

If you have already installed any RST version on the computer on which you plan to use DaViT, not to worry, just leave it be.

Before the installation

There are some dependencies that need to be fulfilled before you can successfully compile the RST. You need to have installed the following packages:

```
doxygen
libncurses5-dev
```

These are usually part of Linux distributions so you should be able to use your favorite package manager to install these (`apt-get`, `synaptic`, `yum`, etc.).

Install CDF

CDF is a data format developed by NASA and used in the RST. Open a web browser and use your favorite search engine to search for “NASA common data format” (without the quotes) and you will find the web page where to download the CDF software as a zipped tarball - <http://cdf.gsfc.nasa.gov/> at the time of writing. Click Download CDF Software, then select the latest stable release, change into the directory `linux` and download the `cdffx_x-dist-cdf.tar.gz` where the `x` represent the version number of the CDF software.

Supposed you downloaded the tarball into your home directory `/home/user`. Then unzip and untar the CDF package:

```
cd /home/user
gunzip cdfXX_X-dist-cdf.tar.gz
tar xvf cdfXX_X-dist-cdf.tar
```

The last command will create a directory called `/home/user/cdfXX_X-dist`. Enter the directory `/home/user/cdfXX_X-dist` and compile the CDF software: you must provide the OS and ENV keyword to the `make` command, type `make all.help` to find the right options. Usually on Linux,

```
cd /home/user/cdfXX_X-dist
make OS=linux ENV=gnu all
```

will do the trick, i.e. compile the CDF software. You now need to install the binaries and we recommend installing the CDF software into `/usr/local/cdf`. In order to be able to do that, you need to have the according privileges. If you cannot run commands as superuser, choose any other directory.

```
make INSTALLDIR=/usr/local/cdf install
make clean
```

Check that the directory `/usr/local/cdf` exists and that it contains some files. If so, you have successfully installed CDF.

Install netCDF

netCDF is kinda like CDF, but not really, who knows. Again, the RST can use the netCDF file format so you need to have the software installed first. Open a web browser and use your favorite search engine to search for “unidata netcdf” (without the quotes) and you will find the web page where to download the netCDF software as a zipped tarball -

<http://www.unidata.ucar.edu/software/netcdf/> at the time of writing. Click Downloads -> netCDF, and under “NetCDF C Stable Releases” download the zipped tarball called `netcdf-X.X.tar.gz`, where again the `x` represent the version number. Supposed you downloaded the tarball into your home directory `/home/user`. Unzip and untar the netCDF package:

```
cd /home/user
gunzip netcdf-X.X.tar.gz
tar xvf netcdf-X.X.tar
```

The last command will create a directory called `/home/user/netcdf-X.X`. Enter the directory `/home/user/netcdfX.X` and compile the netCDF software. If you choose to install netCDF system wide in `/usr/local/netcdf`, you will

need the correct privileges. In the directory `/home/user/netcdf-x.x`, enter (with the correct privileges)

```
./configure --prefix=/usr/local/netcdf --disable-netcdf-4
make check install
```

Once you have installed these four packages (doxygen, libncurses5-dev, CDF, and netCDF) you should be able to install DaViT and compile the RST without problems.

Obtaining DaViT

Ask Nathaniel at nfrissell@vt.edu. Typically, you will be given a URL from which you can download a zipped tarball. We recommend that you install davit in the directory `/usr/local/davit`, i.e. system-wide. You will need the right privileges to be able to do that. From now on, we will assume that you want to install DaViT into the directory `/usr/local/davit`.

Place the DaViT tarball in the directory `/usr/local` and unzip and untar it there.

```
cd /usr/local
gunzip davit.tar.gz
tar xvf davit.tar
```

The last command will create a directory called `/usr/local/davit`.

Compiling the RST

Change into the DaViT directory `/usr/local/davit/lib/rst`, and open the file `profile.superdarn-rst.linux.bash` with your favorite text editor. Change the `HOME_PATH` directory to point to your RST location in this case `/usr/local/davit/lib/rst`. Change the `NETCDF_PATH` to your netCDF directory, i.e. `/usr/local/netcdf`. Change the `CDF_PATH` to your CDF directory, i.e. `/usr/local/cdf`. Change the `IDL_IPATH` to the subdirectory `external/include` of your IDL installation, usually to `/usr/local/itt/idl/external/include` or similar. Change the `IDL_PATH` to point to your IDL installation, usually `/usr/local/itt`; while changing the `IDL_PATH` keep the plus signs before the directories!

Compiling makeall

`makeall` is a helper routine which is part of the RST. In order to compile the RST, you need to compile `makeall` first. In the following steps, the `x` represent version numbers.

```
cd /usr/local/davit/lib/rst/↵
```

```
codebase/base/src.bin/build/makeall.X.XX
source /usr/local/davit/lib/rst/↵
profile.superdarn-rst.linux.bash
make
```

This should compile `makeall`. You can test the `makeall` binary by entering

```
cd /usr/local/davit/lib/rst/bin
./makeall
```

and see what the output is. It should be some sort of help message.

Compiling the RST

Enter

```
cd /usr/local/davit/lib/rst
source profile.superdarn-rst.linux.bash
make.code superdarn rst
```

That should set off a rather long compiling process at the end of which you have successfully installed the RST!

Installing DaViT

Once the RST is compiled, everything should be in place to run DaViT. It is assumed that DaViT resides in `/usr/local/davit`. You need to adjust some paths before you can use DaViT. To achieve that, you need to edit two files, `/usr/local/davit/env/env_davit` and `/usr/local/davit/bin/davit`. In `/usr/local/davit/env/env_davit` enter the correct paths where it says `[EDIT]`. In `/usr/local/davit/bin/davit` edit the path to the SuperDARN data in section 2.

Running DaViT

To start DaViT, enter

```
source /usr/local/davit/env/env_davit
/usr/local/davit/bin/davit
```

Once you hit enter, IDL should start up and compile some routines. Try some of the tutorials from this page: <http://vt.superdarn.org/tiki-index.php?page=DaViT+Tutorials>, like reading fitACF data and plotting an RTI plot.