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Ferret Home Page

Ferret Installation and Update Guide

Version 4.91 -- UNIX

June 1998

Installing Ferret

Updating Ferret

Welcome to the Ferret user community!

This installation guide assumes the installer is familiar with the UNIX system. He or she must be familiar with the file system of the target computer, and may need system privileges if installing Ferret in a root-owned directory.

If you install this software we ask you to please notify ferret@pmel.noaa.gov and indicate what type of computer system you are using. We've also formed a Ferret Users Group so that

- we can let you know of significant new developments.
  (occasional messages -- e.g. availability of point-and_click Ferret)
- Ferret users can share questions and solutions.

To join, simply email to Majordomo@ferret.wrc.noaa.gov and include a message which says:

```
subscribe ferret_users
```

(Note this must be in the message **BODY** -- not in the subject line.)

To learn about the users list without joining send this message instead to the same address:

```
info ferret_users
```

Downloading the tar files

You will require approximately 30 Mbytes of disk space to install Ferret, preferably on your '`/usr/local`' file system. Another 30 Mbytes are needed on a disk device to install the demonstration data sets. If disk space is a problem, the section Reducing Disk Space Required in this installation guide provides assistance with which files are safe to delete.

The Ferret distribution is made up of three compressed tar files:

- fer_executables.tar.Z (Ferret and utilities)
- fer_environment.tar.Z (support files)
- fer_dsets.tar.Z (sample data sets)

All three of these files need to be placed on your system. After acquiring them, follow the steps below to install the application.

Installing support files

1. Determine a suitable location on your file system to install the Ferret program and its support files. The location we recommend is '`/usr/local`'. You will need 30 Mb available there. From there, create the directory '`ferret`', and change directory to it.

   `% cd /usr/local` (our recommendation, but it's your choice)
   `% mkdir ferret`
   `% cd ferret`

   This guide will use the name `$FER_DIR` to refer to this directory ('`/usr/local/ferret`' -- or your choice, if different).

2. The file '`fer_environment.tar.Z`' holds the Ferret support directories and associated files. To install the file

   ```
   % zcat $GET_LOCATION/fer_environment.tar.Z | tar xvf -
   ```

   where `$GET_LOCATION` is the directory you put the compressed tar file in when getting it via ftp. Be sure you're in the `$FER_DIR` directory when you run this command. When that's done, running '`ls`' in that directory should give the following listing:

   ```
   % ls -1F
   bin/
   contrib/
   ```

```
doc/
examples/
go/
ppl/
```

3. Now determine a location on your file system suitable for Ferret's sample data files. You'll need 30 Mb available. From there create a directory '`fer_dsets`', and change directory to there.

   ```
   % cd ... (for example, '/home/data_disk')
   % mkdir fer_dsets
   % cd fer_dsets
   ```

   This guide will refer to this directory by the name `$FER_DSETS`.

4. Extract the sample data set directories from their compressed format:

   ```
   % zcat $GET_LOCATION/fer_dsets.tar.Z | tar xvf -
   ```

   Again, `$GET_LOCATION` is the directory where the tar file resides. Be sure to be in `$FER_DSETS` when running this command. Executing '`ls`' from that directory should give the following listing:

   ```
   % ls -1F
   data/
   descr/
   grids/
   ```

Completing the installation with Finstall

After these directories are created, two steps complete the installation of Ferret, and you can begin using it. There is a shell script called '`Finstall`' to help you with these two tasks. (One other step documented in the section Setting Up the Hard Copy Environment sets up easy printing of hard copy from Ferret plots.)

The Finstall script is in the '`bin`' subdirectory of `$FER_DIR` (where you put the Ferret support files) and can be invoked by referencing the complete path to it:

```
% /usr/local/ferret/bin/Finstall (for example)
```

Finstall will then ask you to select from two options, corresponding to the remaining steps:

1. **Install executables:**
   This option extracts files from the compressed tar file '`fer_executables.tar.Z`'. You'll want to run this option if you're installing Ferret for the first time, and also if you're updating a Ferret you already have.

   When these files are extracted by Finstall they're placed in '`$FER_DIR/bin`'; the two files extracted are the Ferret program itself ('`ferret`') and the program that translates Ferret's graphics metafiles to PostScript for hard copy ('`gksm2ps`').

To install the executable:

1. Select Option 1 after invoking Finstall.
2. Finstall prompts you for the directory you installed the Ferret support files in (`$FER_DIR`). Enter the complete path to that directory.
3. Finstall prompts you for the directory you currently have the fer_executables tar file in (`$GET_LOCATION`). Enter the complete path to that directory.
4. Finstall then installs the executables in '`$FER_DIR/bin`'.

2. **Customize '`ferret_paths`':**
This option modifies the '`ferret_paths_template`' script to set environment variables FER_DIR and FER_DSETS to the directories at your site where the Ferret software and demonstration data were placed. The modified file is written out as '`ferret_paths`' and placed in a directory you will be asked to specify.

> We **STRONGLY RECOMMEND** that the new file **NOT** be placed anywhere inside of the `$FER_DIR` directory tree. Modifications inside of `$FER_DIR` may cause complications when future versions of Ferret are installed. Instead, we recommend that the new file be created in '`/usr/local`' or another directory that will be in the users' PATH variable. This guide will refer to that directory by the name `$SET_FER`. The '`ferret_paths`' file, after it's customized, may be used to set up the users' environment to run Ferret (For more detail, see the explanation in '`$FER_DIR/bin/ferret_paths_template`').

To customize '`ferret_paths`':

1. Select Option 2 after invoking Finstall.
2. Finstall prompts you for the directory you installed the Ferret support files in `$FER_DIR`. Enter the complete path to that directory.
3. Finstall prompts you for the directory you installed the Ferret sample data files in (`$FER_DSETS`). Enter the complete path to that directory.
4. Finstall prompts you for the directory you wish to place the `ferret_paths` file in `$SET_FER`. Enter the complete path to that directory.
5. Finstall then creates '`ferret_paths`' in the directory you specified.

After the '`ferret_paths`' file customization is complete, execute the Ferret setup procedure with the command

```
% source $SET_FER/ferret_paths
```

Access to Ferret and its supporting routines is through the addition of '`$FER_DIR/bin`' to your PATH environment variable. This addition will be done automatically when the command '`source $SET_FER/ferret_paths`' is issued.

Ferret can now be run by entering

```
% ferret
```

Running Ferret with the GUI

Ferret can be run with the Graphical User Interface (GUI) by entering

```
% ferret -gui
```

If you wish to customize the ferret GUI you must first install the file '`$FER_DIR/doc/Ferret_4.40_xdefaults`' which contains parameter defaults used by your X windows system to run the Ferret GUI. The GUI has fallback resources in case no app-defaults file is found but these are ignored if the app-defaults file exists. (regardless of what the app-defaults file contains!) Therefore: **You should not delete any entries when modifying the app-defaults file.**

To install '`Ferret_4.40_xdefaults`':

1. Use the Unix '`su`' command to become super-user. (Get help from your system manager if this command is unfamiliar.)
2. Create a soft link in the X11 defaults directory to the '`$FER_DIR/doc/Ferret_4.40_xdefaults`' file The soft link should have the name '`Ferret`'. On systems based on Motif window managers (most Unix systems) this will be the command:

   ```
   ln -s $FER_DIR/doc/Ferret_4.40_xdefaults /usr/lib/X11/app-defaults/Ferret
   ```

   On Sun systems running OpenWindows use, instead, the command:

   ```
   ln -s $FER_DIR/doc/Ferret_4.40_xdefaults /usr/openwin/lib/X11/app-defaults/Ferre
   ```

Setting up your display environment

To get graphical output from Ferret at your workstation, you must have the X Windows environment variable DISPLAY defined properly. Set the variable to point to the workstation screen where you want Ferret graphical output displayed. In the example below graphics output will be sent to the screen of workstation `anorak`.

```
% setenv DISPLAY anorak:0.0
```

Ferret supports X Window graphical output, and PostScript is used to provide hard copy of plots. Sequential screen images can also be saved as HDF "raster8" files and animated; single images can be saved as "gif" files.

Documentation

Examine the files located in '`$FER_DIR/doc`' for a number of online documents about Ferret. Files ending in '`.ps`' are in PostScript format and are intended for printing on PostScript printers. Other documents are not intended for hard copy but are ASCII text versions of the PostScript documents. They are suitable for on-line review.

The script '`print_ferret_docs`' when run will present a menu from which you may choose documents to be printed.

For a productive and smooth start using Ferret, review the Demonstration Files section of the Ferret User's Guide (Type '`Fhelp "demonstration files"`' at the shell prompt for a list). Tutorial scripts demonstrating Ferret data sets and usage are documented there. We recommend trying them out first.

In addition, the tutorial scripts (journal files) in '$FER_DIR/examples' are excellent source material for your own scripts. Copy any or all to your own area and print out, study and modify them to suit your needs.

Note that the interactive help available from the commands Fhelp, Fapropos, and Ftoc require that the files 'ferret_users_guide.txt' and 'ferret_ug_toc.txt' be online.

As of September 1996, a new Ferret User's Guide for Ferret V4.4 is under development -- not yet distributed. The information contained in the Ferret User's Guide with this release may refer to version 3.1 of Ferret. The on-line release notes available at http://www.pmel.noaa.gov/ferret/home.html should be referenced to augment this version of the user's guide.

Additional on-line documents, including this installation guide, are also avalable at the URL above.

Reducing Disk Space Required

Various directories and files may be deleted if disk space is a concern. Below is an outline of the considerations for deletable directories.

If you have no use for PostScript documentation files you may delete '$FER_DIR/doc/*.ps' ('pplus_fonts.ps' is over 2 Mb). If you have no use for online copies of the documentation in ASCII files then you may safely delete from directory '$FER_DIR/ferret/doc' all files, '*.txt', except 'ferret_users_guide.txt' and 'ferret_ug_toc.txt'. Up to 1 Mb may be recovered.

You may selectively delete the data files in '$FER_DATA/data'. These files are used by several of the GO examples located in '$FER_DIR/examples'. Potential savings of up to 25 Mbytes are possible by deleting these data.

Setting up an account to run Ferret

To set up a user account to run Ferret (C-shell only) add the following line to the '.login' file for that account:

`% source $SET_FER/ferret_paths` (see Customize `ferret_paths`)

To properly set up the account to produce plots and other graphs, a user must have set the environment variable DISPLAY, as explained above. This can be done by using the 'setenv' command in the user's '.login' file, for example:

```
% setenv DISPLAY anorak:0.0
```

Special Environment Variables and Files

The three environment variables FER_DATA, FER_DESCR, and FER_GRID have been set up to point to the sample data sets included with Ferret. Each of these defines a path to the files Ferret needs to properly access data sets. The pathlist can be expanded to suit your needs. In particular, FER_DATA may be a path to directories residing on several devices; thereby allowing data sets to be large, quite possibly spanning more than one file system. (NetCDF files are pointed to by FER_DATA.)

As you become more familiar with Ferret through use and reading documentation, you may want to modify these pathlists from the way they are now defined in the script '`ferret_paths`'. A file in directory '`$FER_DIR/bin`' called 'my_ferret_paths_template' will help with this. See the section in the Ferret user's guide covering UNIX account set up for that optional modification.

Ferret also uses an optional initialization file, '`.ferret`', located in the user's $HOME (login) directory. This file, if it exists, will be executed automatically each time Ferret is started up, permitting Ferret to be tailored to individual needs and styles. The format of the file is like any other Ferret "GO" file -- an ASCII file of Ferret commands, one command per line.

Setting up the Hard Copy Environment

Hard copies can be made from Ferret plots very easily.

Plots must be saved on disk as "metafiles" before hard copy can be made; the GKSM metafile format is used to record Ferret plots on disk. To create metafiles, within a Ferret session, invoke the Ferret command '`SET MODE META`'. Subsequent plots will be saved in metafiles. To cancel recording of plots, specify '`CANCEL MODE META`'. The metafiles will by default be named '`metafile.plt`' and sequential, emacs-style version numbers are used to uniquely identify each plot file by appending a suffix of '`.~nnn`', where `nnn` is a unique version number.

There is a shell script supplied with Ferret (, in the '`$FER_DIR/bin`' directory, that both translates the metafiles to PostScript and routes the resulting files to a printer. You'll usually use the script -- modified slightly to include the printers at your site -- to print Ferret plots. (For consistency at Ferret installations, we ask that if you use the script you retain the syntax outlined below for its use. Feel free to modify the syntax and give it another name, or write new scripts; but please use a different command name in that case.)

The example script is named '`Fprint_template`'. The modified file should be called '`Fprint`' and placed in a directory that will be in a user's PATH (we suggest '`/usr/local`'). As with the '`ferret_paths`' file (see section Customize 'ferret_paths') we strongly recommend the edited file not be placed in the $FER_DIR directory tree. Please look in the '`Fprint_template`' file for instructions to help you add your site's printers to the script. There is an Fprint document in the '`$FER_DIR/doc`' directory suitable for general use as a guide to Fprint's syntax.

The command Fprint has a syntax allowing specification of the printer to be used and the metafiles to be processed. Invoking '`Fprint -help`' will give u sage information. '`Fprint`' uses as default the printer named by the environment variable PRINTER; or the destination printer can be named: Here are a few examples:

```
% Fprint metafile.plt*
% Fprint -P printer_name metafile.plt*
% Fprint -P printer_name metafile.plt.~3~ metafile.plt.~7~
```

The first example sends files '`metafile.plt*`' to the default printer (determined by environmen t variable PRINTER), the second sends all '`metafile.plt*`' files to '*printer_name*', and the last sends the indicated plots to that same printer.

Fprint can be used to translate a metafile and output the result to a disk file in PostScript format; Fprint also renders metafiles on a X Window workstation for review.

Hard copy of a plot is generated by Fprint in two steps:

1. conversion of the device independent GKS metafile to PostScript, the well-known page description language

2. routing the PostScript file to a particular device.

The conversion is done by the command '`gksm2ps`', which is supplied with Ferret. Both its syntax and examples of use are given in the Ferret User's Guide. An example of its use to convert one plot file ('`metafile.plt`') to a PostScript file ('`gksm2ps_output.ps`') is:

```
% gksm2ps -o gksm2ps_output.ps metafile.plt
```

Routing that file to a printer could be done manually with:

```
% lpr -s gksm2ps_output.ps
```

Updating your Ferret installation

The Ferret system has two components, the environment -- or support -- files, and the executables. We may add enhancements to the two parts independently. If Ferret was installed at your site months ago, or you receive Ferret User Group listserver email announcing an update, consider updating your installation. Here's how you can update either or both components:

Updating the environment files

The update contains recent enhancements, usually including Ferret scripts adding new capabilities, demonstration scripts, documentation, and more. The latest update (or "patch") to the environment files is in the distribution directory for each system we support, and named

```
patch_DATE.tar.Z        where "DATE" is a date, for example "28aug95"
```

The file name has the date we created the latest update. If you have gotten updates before, check the patch README file in your directory $FER_DIR; if it was created before that date, you will benefit from picking up the latest update. If you've not gotten updates previously and the patch file is more recent than your Ferret installation, the update will have something new.

The update procedure uses the shell script "Fpatch". The update (the patch) should be added only after you have installed FERRET on your system. Follow these steps to install the patch file:

- Get the patch_DATE.tar.Z file in binary mode.

- Also get the file ’Fpatch’, then change its mode to be executable:

  ```
  % chmod +x Fpatch
  ```

- Begin the patch install by invoking

  ```
  % Fpatch
  ```

  1. Select Option 1 after invoking Fpatch.
  2. Fpatch prompts you for the directory you installed the FERRET support files in ($FER_DIR). Enter the complete path to that directory.
  3. Fpatch prompts you for the directory you currently have the patch file in. Enter the complete path to that directory.
  4. Fpatch will prompt you for the patch file name. Enter it here.
  5. Fpatch then installs the new files in $FER_DIR, and creates a README file in that directory logging the date of the update and the name of the patch file.

Updating the Ferret executables

The file ’fer_executables.tar.Z’ in the distribution directory holds the ferret and gksm2ps programs that you picked up when you first installed Ferret. We update those with enhancements and bug fixes periodically.

Get and examine the file in the distribution directory named ’FERRET_VERSION_HERE_IS_...’. It lists the version of ferret and gksm2ps available. If the version of either is higher than what you have, you will benefit from picking up the update and installing it. To find the version of Ferret you have installed, run

```
% ferret
```

When ferret starts up it will list the version number, e.g., "Version 4.10 - 08/25/95". You can determine the version of gksm2ps you have by running

```
% gksm2ps -v
```

The application will respond with, e.g., "Version number of gksm2ps: Mod 1.03".

To update these files:

- Get the fer_executables.tar.Z file in binary mode.
- As in your original installation, run the script

  ```
  % Finstall (it is in your directory $FER_DIR/bin)
  ```

  1. Select Option 1 after invoking Finstall.
  2. Finstall prompts you for the directory you installed the FERRET support files in ($FER_DIR). Enter the complete path to that directory.
  3. Finstall prompts you for the directory you currently have the fer_executables.tar.Z file in. Enter the complete path to that directory.
  4. Finstall then installs the executables in $FER_DIR/bin.