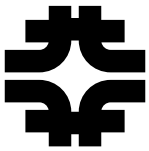

Fermi National Accelerator Laboratory

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Fermilab Software Tools Program - Fermitools

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FERMILAB SOFTWARE TOOLS PROGRAM - FERMITOOLS

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The Fermilab Software Tools Program (Fermitools) was established in 1994 as an initiative under which Fermilab provides software it has developed to outside collaborators. During the year and a half since its start ten software products have been packaged and made available on the official Fermilab anonymous ftp site, and backup support and information services have been made available for them.

1 Introduction

During the past decade, institutions outside the Fermilab physics experiment user community have in general only been able to obtain and use Fermilab developed software on an ad-hoc or informal basis. With the Fermitools program the Fermilab Computing Division has instituted an umbrella under which software that is regarded by its internal user community as useful and of high quality can be provided to users outside of High Energy Physics experiments.

The main thrust of the Fermitools program is stimulating collaborative use and further development of the software. Having established minimal umbrella beaurocracy makes collaborative development and support easier

The published caveat given to people who take the software includes the statement “Provision of the software implies no commitment of support by Fermilab. The Fermilab Computing Division is open to discussing other levels of support for use of the software with responsible and committed users and collaborator”. There have been no negative comments in response to this and the policy has not given rise to any questions or complaints.

In this paper we present the goals and strategy of the program and introduce some of the software made available through it. We discuss our experiences to date and mention the perceived benefits of the Program.

2 Details

Software Products accepted into the Fermitools are made available on the Fermilab anonymous ftp site - *ftp.fnal.gov.* Information about the software is available through a dedicated www server at url *http://www-fermitools.fnal.gov/*. An internal Fermilab working group meets regularly to review the software provided, the requests and feedback from outside collaborators who are making use of the software, and discuss software that could be included in the future. There is a wide range of software already available under the program - from the popular graphical editor NEdit, to software for embedded FASTBUS readout controllers.

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3 Experiences

Overall the experiences gained through Fermitools have been positive. We have made available a wide variety of software packages. We monitor shows the www server and ftp site and which show a steady stream of people copying the software. The email traffic is low rate but constant, with nearly all email giving positive feedback on the software used.

Software developers at Fermilab have started to request inclusion of their packages in the Program. The requirements of the Program have given rise to an increased emphasis on user and reference documentation and demonstration programs. Ease of installation and use of the software- all laudable goals in their own right - have increased in importance. Software that is proposed for the program has some level of review and test - which provides an incentive for the developers to produce code they are proud of.

4 Focus on the Software.

Table 1 below shows the range of software currently included in and planned for Fermitools:

Table 1: Software Available From Fermitools

SPUDS	PC based front end module diagnostic environment - CAMAC and FASTBUS.
FRC	Software in support of the CDF FASTBUS Readout Controller.
shiva	Astronomical data analysis framework.
Plot_Widgets	Motif widgets for graphing and plotting.
Histoscope	Tool to select and display histograms, n-tuples, and scalar values from a program as data is being created or analyzed
NEdit	GUI style plain-text editor for X/Motif systems.
CPS	Software to support parallelization of a computational task among a distributed set of processors
murmur_kit	A Unix and VxWorks distributed error reporting and display system, using tcp/ip for communication and Xwindows for display.
juke	Software package for interfacing with tape, CD, and other media jukeboxes.
OCS	Package that performs and manages tape drive allocations, operator assisted tape mounts and tape drive use statistics.
Transport	Program to design charged particle beam transport systems.

Table 1: Software Available From Fermitools

MXYZPTLK*	Automatic differentiation package
DCS	CAD drawing repository and management system
ESHTRK*	SQL interface for Problem Report tracking, reporting and management of ES&H issues.
	* versions in preparation

Other products which are potential candidates for inclusion in Fermitools based on perceived interest from the wider community and extended use among the Fermilab local user community are: ups- Unix product management software; DART run control - described in another paper submitted to this conference; jy411s - interface and control software for the Jorway 411 SCSI to CAMAC controller; webshare - a collaborative authoring tool over www developed at CDF.

We now superficially introduce some of the products that have been downloaded and used by offsite users in the last few months. Clearly it is not possible nor appropriate to give an in-depth description of each feature of the software here and we refer you to the Fermitools www descriptions of the software.

4.1 juke

"juke" is an extensible software package for interfacing with tape, CD, and other media jukeboxes. It can be used for controlling tape jukeboxes for data analysis, backups, etc. where tape mounts are needed at times when it is inconvenient for human operators to perform them, or for automated labeling of batches of tapes etc.

The "juke" package supports controlling multiple jukeboxes per host, multiple hosts per jukebox, etc. with control being shared over a network. "juke" deals with multiple jukebox types by treating them all as having simple, abstract components; the tapes themselves, slots to hold the tapes, drives which can play, read, or write the tapes, and "mailbox slots" which can be uncovered for people to take tapes in and out of the jukebox, or covered for the jukebox to be able to manipulate the tapes.

Interest and activity on “juke” have occured from INFN in Italy, SLAC, Comissariat a l’Energie Atomique in France, the College of William and Mary, and MIT. juke has been successfully modified by outside users to work with 4 mm DAT tapes at Brookhaven, and the port to AIX V4.1 (Fermilab is currently using AIX 3.2.4) was done by the French - thus giving us some payback from the program.

4.2 Histoscope Plot_Widgets

The Histo-Scope Widget Set is a collection of six Motif widgets for graphing and plotting. It features the high performance and screen stability necessary for animation, and includes interactive controls for direct manipulation with the mouse. The widgets were developed

for an interactive data browsing tool called Histo-Scope, but are very general and easy to incorporate into other Motif applications. Widgets include line plots, 2-D and 3-D scatter plots, 1 and 2 dimensional histograms, and several specialty plots.

Since its release the plot_widges and histoscope have been adopted by several groups, including NASA and Brookhaven. A Swedish Image Systems company has been given authorization to include the package in their Linux commercial package. Ports of the software to Linux and HP-UX have been done and contributed back to Fermilab, as well as an integration with in the Khoros software environment.

4.3 NEdit

NEdit is a GUI style plain-text editor for X/Motif systems. Its appeal is its fully graphical design, and command set based on successful Macintosh and MS Windows editors. In NEdit, you can do everything that you can do with a character-based editor, and you can (and will) use the mouse at any step in the process. Since its public domain release last year, NEdit has become the editor of choice for thousands all over the world. It is the "carrot" that draws people to the Fermilab software site. Of the 1277 copies of NEdit made from the ftp site last month 321 were from ".com" and around 500 from university sites. Several requests to include NEdit in commercial products have been granted.

5 Conclusion

The Fermitools program has established a modus operandus for Fermilab to gain credit for the quality software that it has developed that is found to have worth in the wider community. The establishment of a lightweight beaurocracy is allowing us to include the widest range of software developed at the lab for the ongoing scientific program.

The program has been established for more than a year and is run with the minimum of extra resources and with the full participation of the software developers involved. Within the constraints of minimal budget and minimal time we are reaping the maximum benefits to our excellent technical staff within the guidelines of the mission of Fermilab.

6 References

Information about any of the software, or about the potential availability of any other Fermilab software under the program, may be obtained by sending email to fermitools_support@fnal.gov. References to all the software and the overall documentation associated with the Fermitools program may be obtained by accessing http://www-fermitools.fnal.gov/.