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A WWW Interactive Remote Event Display proposal

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Abstract

We propose to provide an up to date interactive event display with limited functionality for spreading information rapidly within a large High-Energy Physics collaboration, such as the DELPHI collaboration. This will be possible with an advanced use of the World Wide Web. A very important aspect of this project is that it will be virtually platform independent.

Main features

The main features of the WIRED (Www Interactive Remote Event Display) project are:

- portability; the code will run anywhere without actual porting;
- transparency; no installation needed, transparent use;
- world wide, platform independent, availability;
- popularity of WWW use within HEP (High-Energy Physics) collaborations, and in particular within DELPHI.

The detailed requirements of the functionalities within the project will be specified in a technical note at present in preparation[1].

It should be noticed that WIRED is intended to be a framework. The DELPHI specific part is used to develop the prototype. WIRED could later be used for other experiments.

Physics motivations

After the first experience of running LEP above the Z^0 energy, it is clear that an interactive event display will be a powerful and necessary tool for the DELPHI data analysis. On the one hand the number of physics events is quite low outside the Z^0 peak, on the other all the searches for new particles or new physics rely on a detailed understanding of the apparatus

and of its hermeticity, which must be continuously checked and monitored by visual event scans. Furthermore the errors and the weaknesses of the analysis and filtering programs must be spotted and corrected as far as possible.
In 1995 during P3 scanning shifts were organized at CERN running a new interactive version of DELGRA on two dedicated Alpha Vax machines under OSF[2]. The scan provided a very fast feedback on the filtering algorithms for different physics channels and on detector and software problems. However, not many physicists were involved in this work and those who could not be physically present at CERN were excluded, thus reducing the potential benefits of the scan. DELGRA could, of course, be installed locally in the collaborating institutions, but this would demand dedicated machines and perhaps a continous upgrade of the installed products.
We think that there is room for a simpler and faster tool which could facilitate the involvement of the entire collaboration in the physics analysis without penalizing groups with their base remote from CERN or with unsuitable hardware platforms.

WWW application

All the institutes collaborating with DELPHI already have access to Internet, and the World Wide Web is well suited for the distribution of scientific information in real time. The same applies to other experiments in HEP.

Users

The users' community comprises the whole DELPHI collaboration.

The project work

The main activity in the WIRED project will be to select, store, and make available for interactive display LEP events collected by the DELPHI detector. In addition, it will be part of the project to maintain the code during its evolution and also the related help/documentation files.
The distribution of help/documentation files using multimedia hypertext programs will be a powerful tool for transmitting information to remote clients.
This work should be carried out in close collaboration with the ECP Division at CERN, and with a group of DELPHI physicists who are interested in the interactive event display mainly for didactic purposes[3].

Events and browsers

Applications which use the WWW for selecting and storing events in a form suitable for the current graphic display (Tanagra banks) have already been developed within the DELPHI collaboration (event server). For the interactive event display we would like to use the Java language and a Java compatible browser, so that the events can be shipped together with the necessary software.
The interactive event display should provide the following functionalities: display and delete totally or partially different banks and subdetectors; zoom and rotation; Lego plots; scaling operations[1].

Our experience

The group comprises senior physicists active in HEP, software engineers, and graduate

students. In addition to scientific activities we have some experience of the Web and its software for didactic applications[4].

Time plan

Assuming that three 'equivalent' people can work on this project, the pilot phase should last about half a year. It should be possible then to have a first test with a Java browser allowing interactive work already in 1996, perhaps with somewhat limited functionality, for evaluation by the collaboration. A final version could be ready in 1997 and could be used by the DELPHI collaboration already during 1997. It is foreseeable that the application could be heavily used at least during the years 1998-9, and perhaps beyond.

Summary

The use of advanced Web technology, including the use of the Java language and a Java compatible browser, should allow the implementation of a platform-independent, flexible and transparent interactive event display, which would meet the needs of a large collaboration in an HEP experiment. Such a tool would make available to the whole collaboration the display of all interesting events as soon as they are produced and processed.

Aknowledgements

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References and Footnotes

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(4) M.C. Coperchio, F.-L. Navarria and T. Rovelli, Simulation of the diffusion process on the Web, presented at the Third International WWW Conference, Darmstadt, April 1995. Un esempio di applicazione didattica su World Wide Web: "Il fenomeno della diffusione", DFUB 95-19, 20 October 1995.

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