INFORMATION SYSTEMS FOR PHYSICS EXPERIMENTS (Part 2)

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Abstract

The use of information systems in Physics Experiments is of an highly distributed nature. The Internet, the World-Wide Web, e-mail, news and other tools are currently used to publish information and allow for collaboration between people in a highly distributed fashion. Most of this information today is static and passive.

1   PROGRAMMING AND ARCHITECTURE

We should start thinking of information in terms of programs and active pieces of code. For instance histograms (the data and the program to create the histogram) could be sent across the Internet for users to discuss about. Another example of active information is for instance an e-mail which knows by itself where to be routed. If receivers are currently away it may reroute itself.

Information systems which use the Internet are in need of passive as well as active information and publishing tools as well as collaboration tools. We assume that those tools will be provided by industry. We are left with providing static information and programming active information in components where needed.

Recent introduction of the Java language makes it possible to allow active information to be sent across the Internet safely. Java, an object-oriented language, also features portability, networking, robustness, multi-threading... It is currently a good choice if you want to implement active information for the Internet. The industrial support for Java and tools for developing in Java is growing rapidly.

Active information in Java can be created in the form of Applets, Aglets and Beans. Applets are (small) applications which can be embedded in an HTML page. Aglets are mobile and autonomous agents, which can go around the Internet to gather information for you. Beans are components, which can be used to build up active documents, or to create Applets and Aglets.

Access to information can be given in Java with the use of network Streams and Servlets (CGI-like scripts in Java)[1], which provide for sequential I/O. Random access to information can be provided by RMI (Remote Method Invocation) or CORBA (Common Object Request Broker Architecture), both of which interface nicely to Java.

Information types (Applets, Aglets and Beans) and access mechanisms (Streams, Servlets, RMI and CORBA) can be used to build up powerful Internet aware information systems. Examples are the JavaServer Administration, in which Applets and Servlets let you administer an http server, the CERN Building interface, in which Servlets let you look up the location of buildings on the CERN site, and On-line Systems, in which Applets access real-time data via RMI or CORBA.

WIRED, which stands for World-Wide Web Interactive Remote Event Display[2], is another example of an information system using the Internet. Although initially created as an event display Applet, which accessed event and geometry information via Stream I/O, it is currently being rebuilt as a set of Beans, to allow people to create applications and Applets from it, or to use it in active documents. While Streams allow for access to small events, bigger events may be accessed using CORBA or RMI.

More complete information, as well as slides of the lectures, material for the tutorial and related pointers can be found on the World-Wide Web under: **http://www.cern.ch/IPT/CSC/1997/**
The WIRED project can be found under: **http://wired.cern.ch/**

2 REFERENCES

[1] M.Dönszelmann, K.Rodden, "Gateways for World-Wide Web in the 'Online' Data Acquistion System of the DELPHI Experiment at CERN", proceedings of the *Second International WWW Conference*, Chicago, U.S.A., 1994

[2] M.C.Coperchio et al., "WIRED - World-Wide Web Interactive Remote Event Display", proceedings of *Computing in High Energy Physics*, Berlin, Germany, 1997.