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基于Internet的虚拟实验室平台架构设计

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摘要: 针对现有虚拟实验室的不足, 提出了虚拟实验室平台的体系结构及实现方案, 对实现虚拟实验室平台的服务器端和客户端所采用的主要技术进行了描述、比较和说明. 该系统结构及实现技术具有以下特点: 以通用的虚拟实验室平台为基础, 以组件方式提供具体的仪器设备构造不同学科的实验室; 可视化地制定自己的实验流程; 动态地引入、创建实验设备对象, 按用户需要下载相关的执行文件和资源文件, 有效地减小了网络流量; 采用多线程技术, 提高了执行效率; 实验室设备(算法和仪器等)以组件的方式开发, 提高了开发效率, 实现了软件重用, 实验室的功能易于扩充; 客户端用Java语言实现, 具有与平台无关、安全、健壮等特点; 使用CORBA技术集成异种对象并实现分布式处理等.

关键字: 虚拟实验室; 组件; Java语言; CORBA技术

Design and implement of virtual laboratory platform based on Internet

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Abstract: In order to overcome the shortage of the current virtual laboratory, the project of architecture and implement of the virtual laboratory platform were introduced in this paper. The key implement and design technologies of its server and client were also described and illustrated in detail. There are some new features in our virtual laboratory platform. (1) Based on the general virtual laboratory, it uses components to provide the concrete facilities to construct laboratories in various domains. (2) Visual tools to design experimental process are provided. (3) It introduces and creates the object of experimental process dynamically, and just downloads relative implement documents and resource documents according to the requirements of the clients. As a result, it can reduce the flow of network. (4) Multithread technique is used to improve the implement efficiency. (5) Laboratory equipment, such as algorithms and instruments, can be developed by means of components to improve the development efficiency, to reuse the software, and to expand the function of virtual laboratory easier. (6) It uses Java in the client, so it is independent of platform, safe and strong. (7) It makes use of CORBA to integrate various objects and to accomplish distributed process.

Key words: virtual laboratory; component; Java language; CORBA technique

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