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Organizing of Distributed Systems Management Via Web Interface

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Abstract

For instance there is a distributed system consisting of UNIX servers that provides some services to users. The task is the following: How to manage distributed system. The last years WWW service of Internet develops rapidly. It is suggested to manage the distributed system via Web interface, for which program packet was created. In the programming packet CGI interface programming is used, that enables the connection between application programs and Web servers.

1 Introduction

The development of computer capacity is noticed periodically. Although the history of computer development shows, that when technologies satisfy already known goals, the new tasks arise, which demand use of new technologies, and more effective resources. The automation of scientific researches and examinations belong to such kind of problems, distinctive features of which are calculating processes. This and other fields rise the necessity of creating distributed information systems. The use of separated information systems is profitable from the financial point of view and it is possible to reach high productivity by joining the magnification of the available computers.

However separated systems organization is difficult task because it is necessary to provide accordant programming environment (operation system, programming languages and application programs), reliable transfer of the information between the sites (loss of information, network modification, development, overload), organization of used distributed systems, management, security, etc.

Considering expansion of UNIX server-net and coming from the above mentioned it is important to elaborate the basic approaches of the realization of distributed systems on the background of UNIX servers with different structures.

It will make possible to realize this kind of tasks with minimum expenditure, which needs to demand parallelism and big calculating magnification. Common characteristics of OS are: multiprocessing, multi-user mode, processor saving mode, safe loading. UNIX supports physical paralleling of calculations for multiprocessor computers, but it doesn't depend on running of more than one program simultaneously.

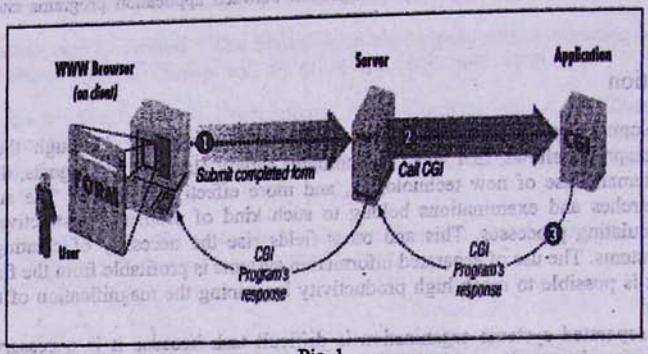
The purpose of the article is to provide programming environment for distributed systems from U server-site, which can transfer information through TCP/IP protocols, which will provide the management of separated systems.

The work has been done in the following direction.

The organizational goals search and clarify the task (problem) of the distributed systems on the U server background. To provide rich graphical environment providing guarantee distributed-system-programmer-user-dialogue.

To develop programming environment (package) which will make it possible to guarantee management of distributed systems.

By that distributed system we can use free capability of those servers. Last years the WWW service of Internet is developing rapidly. WWW service works by the client-server model. The authors uses Apache WEB server for UNIX OS, because it is reliable and is involved in UNIX standard distributive package. The authors suggest managing distributed system via Web interface. The authors created page for managing distributed system. The page was written in national language, because in that case local users will not have language problems. In near future the authors are planning to write it also in English and Russian languages. The user can access those servers (the corresponding addresses) via client-programs.



Pic. 1

CGI (Common Gateway Interface) is a standard connection interface between external application programs and Web servers. Using CGI it can be created CGI programs, which are called scripts and are useful instruments for writing WEB interface programs.

At the first sight it seems that it's a subset of HTTP protocol, but it isn't so, because it is being regulated via server-client interaction, where the client is the active part. Usually WEB servers include static hyper documents. It is possible to create CGI programs by CGI, that interact with such applied systems as are data bases, managing of electronic tables, that enable the user to watch dynamic information on the screen.

There are four mechanisms of information exchange in CGI: via variables, from the command line, via standard input, via standard output. As an executing module it is usually added to cgi-bin folder of WWW server. While inquiring from server to shluse for data transfer server uses command

me and the variables field. The information is transferred to shluse the following way: ame=volume& name=volume&name1=volume1&...., where name is the variable of the name, and ie volume is the volume of that variable. Depending on the method used for inquiring, this line erves as a part of URL (when GET method is used) or as a part of HTTP inquiry (when using OST method). Server also transfers to shluse the volumes of CONTENT_LENGTH and ONTENT_TYPE variables. The environment of those variables is being carried out when the erver realizes shluse program. Usually any component of distributed system can serve as a client, hich gives services to other components of the system, as a server that makes calculations for ilients. Sometimes the same computer may serve as a server and as a client. Minimal distributed ystem, which consists of two components, is shown in the picture.

It is suggested to create distributed system via PVM (Parallel Virtual Package) programming acket that works under Unix OS and is easy to use. When managing of the distributed system via Web interface by using CGI programming, the following opportunities occur:

1. There is a rich graphical interface. The users can run the necessary programs via "rich" graphical simple Web interface. Particularly this interface and CGI programming enables the paralleling of the tasks in interactive mode.
2. Information is available in native language. The users have the opportunity to use the programming packet of distributed system in their native language that allows users to avoid language problems. Particularly the users are given detailed information about distributed system, its management and programming packet. In case of the problems the users can send message to the administrator of distributed system directly from their computers
3. The users of local and global networks can access the resources of distributed system. The users of local and global networks can access the resources of distributed system. And they also have the opportunity to run the necessary parallel tasks from their computers, for which they are to apply to the corresponding address of Web server
4. The remote management of distributed system by administrator. The administrator can manage the distributed system remotely. For which the only term is the accessibility of the WWW service of Internet
5. The idea of distributed system user is define. Identification (User name and password) is defined for each user of the distributed system. Every time, when using the resources of the distributed system the user is to input two parameters: username and password.

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Web ինտերֆեյսի միջոցով տարաբաշխված համակարգի կազմակերպումը

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Ամփոփում

Հոդվածում ֆիտարկվում է Unix օպերացիոն համակարգ օգտագործող սերվերներից բաղկացած տարաբաշխված համակարգ: Խնդիրը կայանում է հետևյալում. ինչպես ղեկավարել տարաբաշխված համակարգը: Առաջարկվում է տարաբաշխված համակարգի ղեկավարումը կազմակերպել Web ինտերֆեյսի միջոցով: Այն իրականացնելու համար օգտագործվում է CGI ինտերֆեյսի ծրագրավորում: Որպես ծրագրավորման լեզուներ օգտագործվում են՝ ANSI C, Perl, Java Script և HTML լեզուները: