Construction of Web Application for Cusp Surface Analysis

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Abstract. This paper describes about construction of Web application for cusp surface analysis. Client accesses to the Web server in order to analyze the data for cusp surface analysis, and a user's browser downloads Web page for data input automatically. Client can be offered through Web browsers by using HTML generated dynamically by Java Server Pages (JSP) technology, or Java applets. Tomcat is operated as a plug-in of Apache to start the Java servlet on the server. Tomcat is the servlet container that is used to carry out cusp for Java. Cusp for Java is applied as Java servlet. It is a java class that extends a J2EE-compatible Web server. Cusp for Java receives HTTP (Hypertext Transfer Protocol) request from the browser, and provides views of result data as HTML.

Keywords: web application, cusp surface analysis, server and client, Apache, Tomcat.

1 Introduction

Conventional technological calculation needs complicate calculation ability and calculation time. Standalone computer performs as calculation machine. In this system, it is difficult to investigate usability of developed calculation program. It is impossible to construct the system installed this calculation program by Rotus Notes (group wear). Internet is used to various information system, it is much proper to the general public communication. The system that developed analytical program is exhibited to by web sever on www (world wide web) is investigated. It is important to exhibit the security of system safety. Five seminars were held by participation of advanced system engineer. And Linux as Web server software and Apache as server software and Tomcat is connected with Java servlet container. Therefore, analytic program is used as Java serve let. Java servlet is server side program performed and processed in the servelet container (Tomcat etc.) for input from client. By applying to servelet, it is can be extended the function of web server. Using this servelet, technical calculation system is developed by server and client method that server processes input from client and the result is sent client. Also, technical calculation system connecting Linux, Apache, Tomcat and Java is almost not found. The tool that analyzed unconscious phenomenon included human factors as creative process is proposed using stochastic catastrophe model [1], [2]. This cusp surface analysis is coded by Java language. Cusp for JAVA file formatted by jar file is used as Java

application. This paper describes that Cusp for JAVA is safe and smooth behaved on web server in order to make the environment in which more researchers use this Cusp for JAVA.

2   Environment of Web Server

This section describes on the environment of structured web server and the environment for web application carried into practice.

2.1   Linux [3]

Linux is UNIX compatible OS developed based on operating system developed by Linux Torvalds of Graduate school student in Helsinki University on 1991. After that, it is opened as open sauce soft ware and revised by developer of volunteer in the world. Linux is not appropriated by existent OS code and is rewritten quite newly. This soft ware is not only free but also liberty. It is revised and distributed based on license system called GPL. Linux behaves even low performance computer lively comparing with other OS (operating system). Also, it is excellent for network function and security and very stable. Linux is distributed academic organization widely and it is adopted individual Internet server as well as enterprise server. There are three systems, that is, Sack ware system, Red Hat system, Debian system.

2.2   Web server

Www system consists of computer sending information and software having function of sending information. Information of HTML documentation and image are stored on Web server and these information is send by means of network of internet etc. responding to needs of client software that is web browser etc. It run a program responds to requirement and has the function of dynamic page generation by which result is sent to client. Java servelet used Java language and web site increase using JSP, ASP of Microsoft.

2.3   Apache [4]

Apache is web server, which is starting to develop on 1995 based on NCSA httpd 1.3. Apache is exhibited as free software and is developed by volunteer programmer in the world. Any one can revises and distributes. Apache is originally developed as patchwork to revise bag and apply to new performance NCSA httpd developed by super computer center in Illinois University (NCSA). At present, Apache becomes web server behaving by itself and using most often in the world.

2.4   Tomcat [3], [5]

Tomcat is name for Java servlet container and web server created by Jakarta project. This Tomcat equips with Java servelet and Java Server Pages (JSP), and is adapt to send to browser the result of running a program respond to request of user as well as using static HTML page.

2.4.1 Tomcat

Tomcat is name for Java servlet container and web server created by Jakarta project. Tomcat can use as single web server, but add on system to other web server. Which method of use can use the method properly? The license called Apache Software License is exhibited, any one can use, revise and distribute. Tomcat starts from Java Web Server (JWS) which is Java servelet container in Sun Microsystems. After this, Jservlet, Jigsaw of CERN/W3C etc. is proposed as Java servelet container of open source, and after penetrating it graduate, Java Server Development Kit (JSDK) supporting JSP is released on 1997. The next year (1998), after JSDK 2.1 proposed by Sun Microsystems is released by James Duncan Davidson of Sun Microsystems core of JSDK server called Tomcat rewritten into new Java servlet engine and Tomcat3.0 is released as succession on JSDK2.1. Since Tomcat is denoted to the Apache Software Foundation as open source project by intention of developer James in Sun Microsystems, Tomcat is managed by the Apache Software Foundation as Jakarta project.

2.4.2 Connection of Apache to Tomcat

Apache cannot process servelet, and Tomcat can use as web server, but Tomcat lacks in responsibility and security. Therefore, Apache plugs in tomcat to behave generally. Then, four connection modules(Apache， Java2 SDK, Tomcat) must be installed on server. Up-to-date Apache2.0 (http2.0.52.tar.gz) should be downloaded and installed from formal site for Apache (http://www.Apache.org).

Next, Java (TM) 2 SDK, SE (j2sdk-1_4_2_06-linux-i586-rpm.bin) should be downloaded and Java is installed from Sun Microsystems (http://Java.sun.com). At
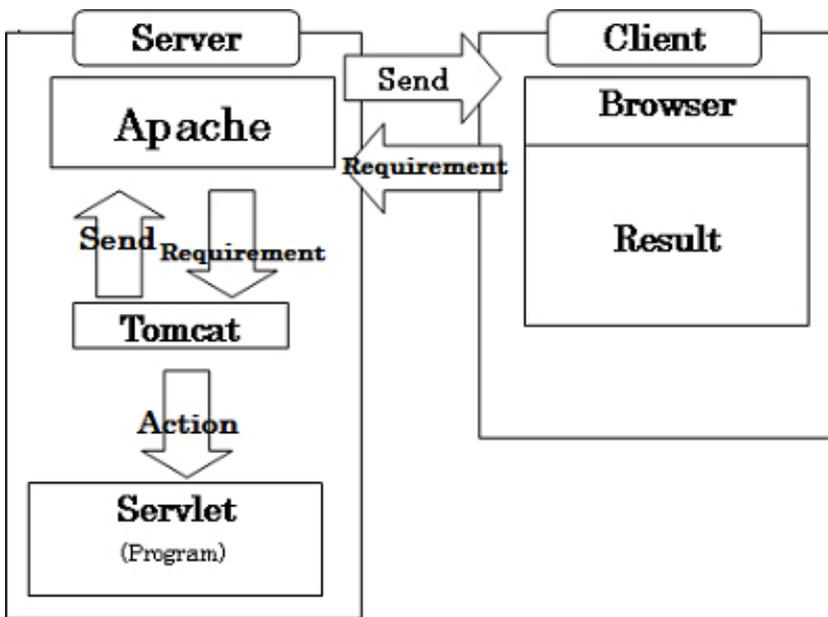
Fig. 1. Connection Behavior Apache and Tomcat

last, from Jakarta Project (http://jakarta.apache.org) on formal site of Apache Tomcat4.1.31 (jakarta-tomcat-4.1.31 trigs) is downloaded and installed. After three installations, it is possible to connect of Apache to Tomcat by means of installation of necessary module (mod_jk2.so) for connection of Apache to Tomcat.

2.5 Java Servelet

Java servelet is Java program that output the result practiced a program and processed to input data from client. Adding servelet, the function of web server can be extended. As servelet is described by Java language, it is possible to operate any web server that equip servelet API without dependence special OS and hardware. Once server program is called, it is permanently stationed at memory. Therefore, it is possible to process speedy different from server side program that is CGI etc. Also, as it is able to treat data permanently, it is shared information between plural users.

2.6 Equipment of Cusp for JAVA to Tomcat

In order to install Java servlet in Tomcat, in the case of installation by default, Tomcat installs in /user/local/tomcat. Tomcat folder in lower layer webapps folder, sarvlet is arranged; the servelet can be started from tomcat.

3 Construction of Web Server

This section describes on the construction method for web server. Starting to install Linux, this section shows installation of server and Java servlet container in detail.

3.1 Installation of Linux

Installation of Linux is describes below.

3.1.1 Installation Method for Linux [3], [4], [6]
Linux is attached as appendix of magazine or book, but in the case of difficulty of acquisition, there is the method that Install file is downloaded from site. The file downloaded can be used as installation CD-ROM by means of writing in CD-ROM etc.

3.1.2 Installation method for Linux
Installation method for Linux is below.

3.1.2.1 CD-ROM. This method can use in the case that there are CD-DRIVE and Red Hat Linux CD-ROM. Boot disk or bootable CD-ROM is needed.

3.1.2.2 Hard disk DRIVE. This method can use in the case that there are CD-DRIVE and Red Hat Linux CD-ROM. Boot disk or bootable CD-ROM is needed. When Red Hat Linuxの ISO image is copied on local hard disk, this method can be used and boot disk is needed.

3.1.2.3 NFS image. When ISO image of Red Hat Linux or mirror image is installed from NSF server, this method can be used.   In this case, network driver disk is needed.

3.1.2.4 FTP. Installing from FTP server directly, this method is used. Network driver disk is needed.

3.1.2.5   HTTP. Installing from HTTP (Web) server directly, this method is used. Network driver disk is needed.

4   Behavior Confirmation and Discussion

In this section, servlet is booted from client, Behavior confirmation of the servlet for Cusp for Java behave on server and Stand alone that Cusp for JAVA is installed in client compare with the servlet for Cusp for Java behave on server.

4.1   Startup for Cusp for JAVA

Server is accessed to designated page from client, top page of Cusp for JAVA as shown in Fig.2 is emerged on browser. Starting up servlet, input picture as shown is appeared on window and numerical values are input in input form. Pushing start bottom, analysis is started and its result is shown. In Behavior confirmation, sample data used previously is inputted. In stand alone，input form shown in Fig.3 is inputted window information with data.txt and data name analyzed is inputted box inputted as data.txt. Pushing bottom existed in lower window. In behavior confirmation, as function of read in file do not use, it should be performed direct input. In handling operation, number of matrix object data is inputted into the box on upper window and push "New" bottom. Input field is decided. Next, object numerical data shown in Table1 input to column of each variable.
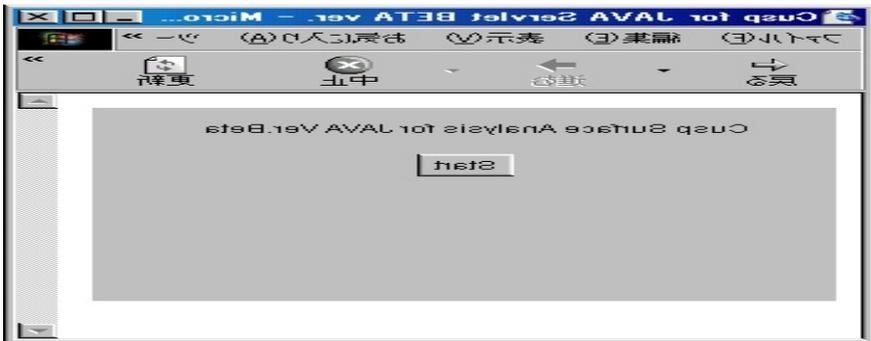
Fig. 2. Top Page for Cusp for Java

Table 1. Sample Data

variable 1	variable 2	variable 3
56.8	56.8	1.81
65.8	69.5	-0.18
71.6	64.2	0.00
61.9	61.1	-2.64
76.8	56.8	-3.23
64.5	53.7	1.29
65.8	69.5	0.53
65.2	60.0	-1.00
58.7	53.7	-3.10
72.3	62.1	1.78
48.4	51.6	4.07
65.2	58.9	0.49
60.0	61.1	-0.10
56.1	64.2	-3.62
61.3	35.8	-0.15
69.0	48.4	-0.97
78.1	61.1	-3.20
78.1	62.1	-0.84
69.0	60.0	-2.11
65.8	60.0	0.43
65.8	60.0	-3.26
69.0	61.1	1.28
65.8	61.1	2.07
71.6	60.0	-0.02
69.0	58.9	-0.60
71.6	58.9	0.17
69.0	61.1	3.36
65.8	60.0	0.42
69.0	61.1	3.50
69.0	60.0	3.81
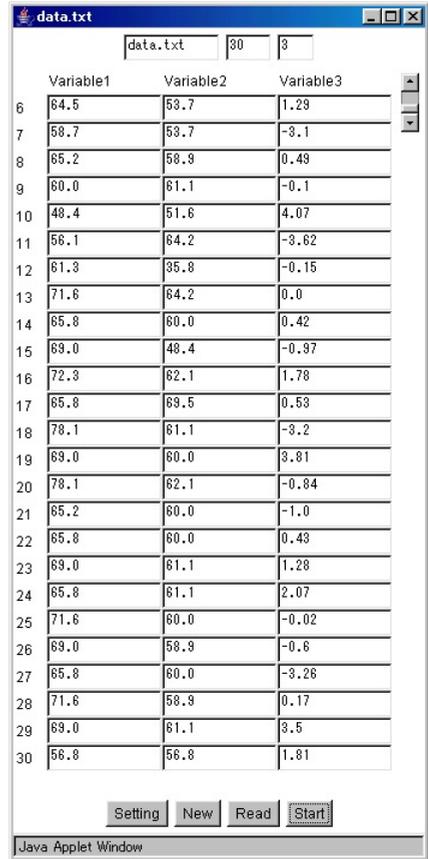
Fig. 3. Input form for Cusp for Java

5   Analytical Results

Analytical results by Cusp for Java are shown in Fig.4, Fig.5, Fig.6 and Fig.7. Fig.4 and Fig.5 are two-dimensional representation, and Fig.6 is three dimensional representation proposed by Kume etc. [2].

6   Discussion

Cusp surface analysis is clarified from behavior confirmation. Because Cusp for JAVA is obtained same as calculated result by stand-alone. The result processed on server the needs from client is sent to client. Cusp for JAVA can read in text file having extension (.txt). When this function for read in text files, the function is excellent reducing handling operation. The function cannot use at present. Client side practiced on server does not interfere. Reason that the function of read in text files does not perform is that the files etc. in client side from Java servlet practiced on server do not interfere using Java servlet.
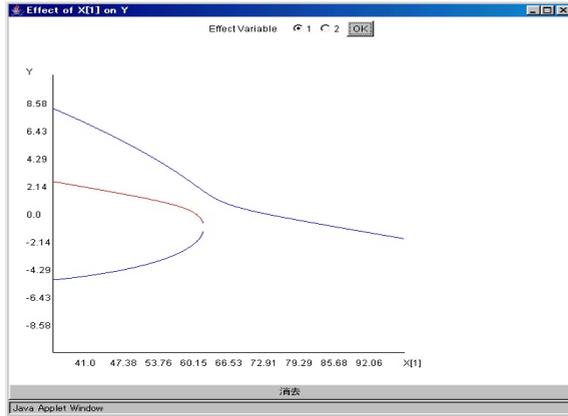
Fig. 4. Relationship between Y and X [1] at X [2]= 59.003
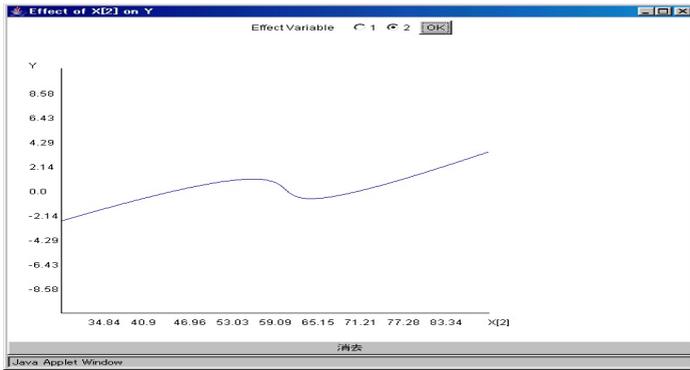
Fig. 5. Relationship between Y and X [2] at X [1]=66.533
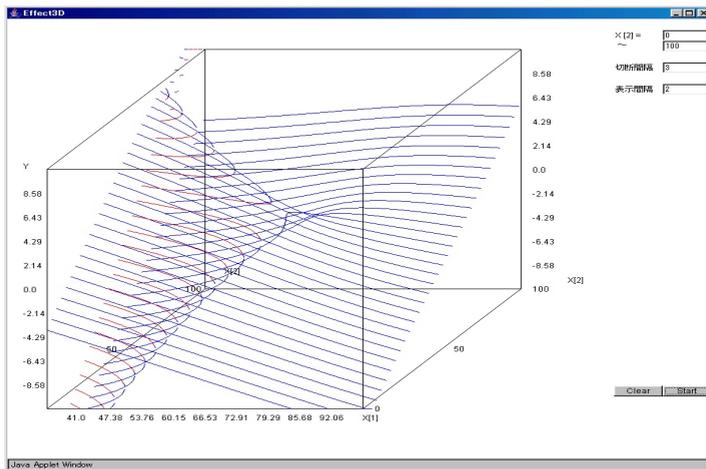
Fig. 6. Effect of X [1] and X [2] to Y
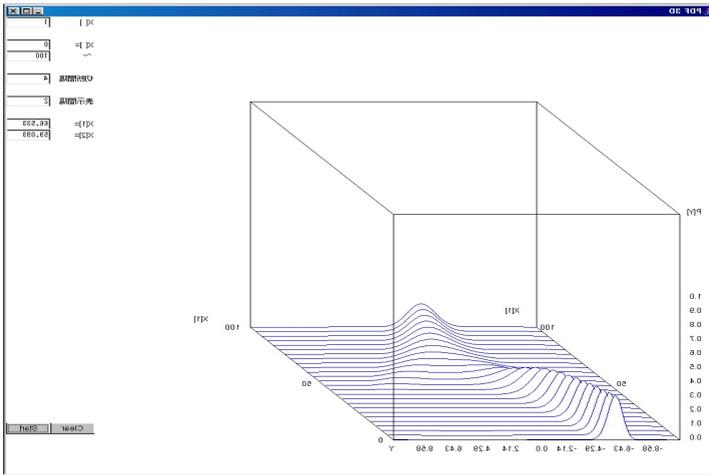
Fig. 7. Transition of Probability density function of Y

7   Conclusion

Handling should operate input of analytical data. But Cusp for JAVA is obtained same analytical result and Apache server receives requirement from client and its requirement transfer to tomcat. Cusp for JAVA carried out in Tomcat start as servlet and send to client. Web application can be constructed. Then, Web exhibition for Cusp for JAVA is able to accomplish this paper. Also, when Java analytical tool is constituted in future, it is possible to open web exhibition using constructed server in this paper. As the problem of Cusp for JAVA in future, server has the function of read in input files and keeping function of output data on server. As the problem of server, it is necessary for servlet user to certify and to customize security.

References

1. Cobb, L.: Cusp Surface Analysis User's Guide, 1–2 (1988)
2. Kume, Y., Okada, K., Cobb, L.: Management of Creative Process Using Cusp Surface Analysis System. In: Proc. of 11th International Conference on Human-Computer Interaction, CD edition (2005)
3. Ttakahara, T.: Introduction to Red Hat Linux 9 Server, Sotech Ltd, co, pp. 77–188 (2003)
4. Ball, B., Pitts, D.: Standard RedHatLinux Reference, Ltd, co INPRESS, pp. 11–205 (2001)
5. Darwin, I.F., Brittain, J.: Hand Book for Tomcat, Ltd.co Orily, pp. 1–282 (2003)
6. SOHO PC-UNIX Lecture for the small and medium enterprise: http://pc-unix.goco.ne.jp/
7. ITNAVI.com: http://www.itnavi.com