

Based on the database of mixed mode of power system graphic platform development

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Abstract— with the gradual development of the power system the graphic platform of power system is more and more diversified. Now popular power system graphic display platform to basically have two kinds of modes: browser server mode (B/S) and client server mode (C/S). Power system increasingly complex, the specific performance of partition and layered structure of power system, and the needing of real time to power system data are different. In general C/S mode requires higher computer performance, expands difficulties, but can ensure real-time. B/S mode requires lower computer performance, easy extension, cannot satisfy the requirement of real-time sometimes. According to the characteristics of two kinds of patterns and considering the actual demand of electric power system a new method is put forward to that the B/S and C/S mixed mode of electric power system graphic display platform which has the database as the core. Through the analysis and verification, this platform can better meet modern power system graphic display.

Keywords—power system; Database; Browser server(B/S); Client server(C/S); graphic platform

I. INTRODUCTION

Power system as the production, transportation and distribution of electricity system, its characteristic is complex and huge, and also presents the characteristics of layers and partitions. Along with the development of electric power system and the deepening of the reform of the power system in China, to ensure safety, high quality and economic power of electricity market operation, and the orderly operation, power dispatching center may also run multiple applications, such as energy management system (EMS), energy measuring system, scheduling production management system, distribution management system (DMS) and electric power market technical support system, etc. Each system may also include the multiple applications, such as the EMS including Supervisory control and data acquisition (SCADA), network analysis and realizable Automatic generation control (AGC), Dispatcher training simulator system DTS applications.[1] The system or application as follows: need to exchange data sharing information, including real-time information and the real-time information, From different developers, need heterogeneous and interoperability; Need expanding new applications or system, and reduce the difficulty of the interface and cost. [9]With the development of computer technology, power systems computation time and resources on the computer, the computer can takes less time to deal with more communication.

In power systems computation as the core of the power system software has been gradually cannot meet the needs of the development of the power system.

II. B/S AND C/S MODE

B/S mode and C/S mode is two different design method of display platform. The server of C/S mode usually adopts high-performance PC, workstations or minicomputers and large database system, such as Oracle, Sybase, Informix or SQL Server is installed. The client needs to install special client software. [2]B/S is the abbreviation of Brower/Server and client installing a browser, such as a Navigator or Internet Explorer. Database, for example, Oracle, Informix or SQL Server is installed in server.

There are many different between B/S mode and C/S mode. First, the hardware environment is different. C/S mode general establishment in special network, the network environment in the small scope, between local area networks provide special server through and data exchange service. While B/S mode does not need to be a specialized network hardware environment. It can use phone Internet, rent equipments and so on. The scope of using is larger than C/S, as long as the range of operating system and the browser will be there. Second, the safety requirements are different. C/S general relatively fixed for the user group, on information security control capacity. General highly confidential information system using C/S structure is suitable. If use the B/S mode, may face relatively weak unknowable users. The security of information will face the challenge. The program structure is also different. C/S program can pay more attention to process, can access to system calibration, while multi-level speed can be less considered. B/S for safety and the consideration of multiple access speed, in need of more than optimization based on C/S there.

The software reuse is different. C/S program can not avoid the integrity of the component reuse, as in the B/S requirements of the component reuse. B/S structure of the multiple, relatively independent component function of relatively good and can reuse. Just as bought into the table can be recycled, instead of doing on the wall of the stone table. The system maintenance of system is dissimilar. C/S due to the whole process, inspection, problem solving and system upgrade. If must be upgraded, it may be a new system. B/S components, aspects of individual component, system change.

The system maintenance costs of seamless upgrade to minimize users from online. You can download and install can upgrade. There are different processing problem of B/S mode and C/S mode. C/S program can handle user surface, and in the same area of fixed, safety requirements and operating system, high demand. Should is the same system. B/S in wan, establish the user group, scattered in different areas, this is the C/S cannot be. It has least relationship with operating system platform. The user interface is different. C/S is established on the platform of Windows, requires higher programmers. B/S is in the browser, has more rich and vivid expression way to communicate with users. And most difficult, reduce cost reduction. Finally, the information flow is different. C/S mode is typical of centralized mechanical processing, interactivity is relatively low. B/S information flow can change, such as Business to Business, Business to Customer, Business to Government, and more like trading center

III. BASED ON THE DATABASE OF MIXED MODE

Database in power system plays an important role in the power system of offline and online data storage. Because the power system with market mechanism into the net, and power system operation of data to share in all departments, because between different departments characteristics of electric power system in real-time demand for is not identical. Such as real-time dispatching center strict operation to get power at any time convenient to monitor and control the running status, and power of the business department network real-time demand is not very high, but with the reform of the ongoing demand more and more diversified and data can change according to demand.

A typical power system graphic platform base on C/S mode is shown as figure 1.

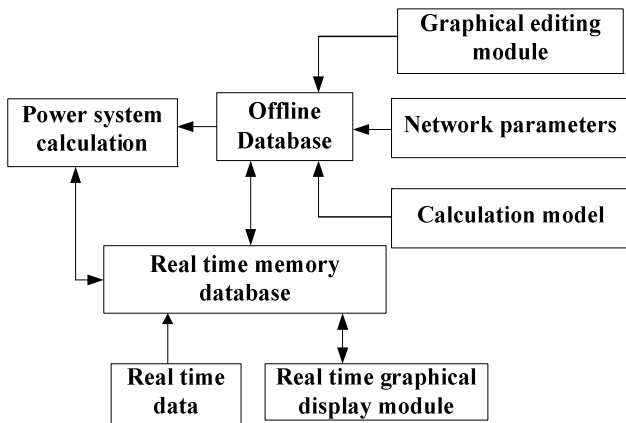


Fig 1 a typical power system graphic platform base on C/S mode

We can see from the graph, the database is divided into offline database and real-time database. The offline database should be used primarily stored in electric circuit, transformers, generator etc various parameters and the mathematical model of real-time computing needed. The real data received from SCADA system is input into the real-time memory database. So the power system calculation program can collect all information needed and can calculation the flow of power system and so on. The results are transmitted to the

real time graphical display module directly. The program of real time graphical display module is installed in client PC.

C/S mode can well meet the power system of data real-time scheduling requirements, but if the C/S mode is applied to other department will cause servers burden, expensive cost, the influence of factors such as the speed. But the B/S mode can well meet the requirements for the sales department, the various data formats. Figure 2 is a typical kind of B/S model of the diagram. According to the characteristics of electric power system using graphics display platform here. The client only needs to install SVG applet. The Web browser can show the needed information. Client extensibility and very low cost and provide relatively flexible way data. This way can well meet the requirements of high performance.

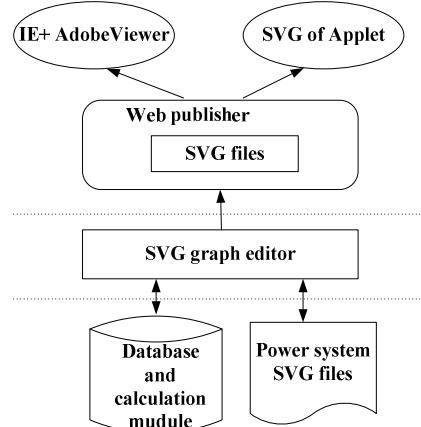


Fig 2 a typical B/S mode in power system

The power system has many department, various departments are not all the same to data real-time requirements. As we can see from figure 1 and 2, C/S mode and B/S mode has different characters and can satisfy different department's needs. Therefore, we can get a new mixed power system graphic platform mode from C/S mode and B/S mode. The hybrid model can meet the needs of the development of modern power system.

IV. SIMULATION

Based on the provincial power system as an example, there are 3895 switches, 117 power stations, 208 lines, 169 transformers, 85 generators and 154 loads. This is a medium-sized power system. If all clients use the C/S mode, the costs are very high and are not necessary. But if all clients use the B/S mode, the real time data can not be ensure.

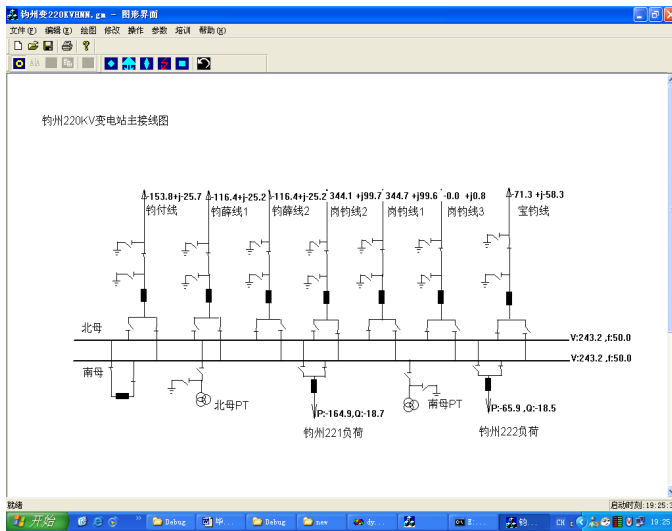


Fig3 the client of C/S of a power system

The client of C/S mode, can real-time using the platform of power system stability and real-time data display and can be remote operation, can well meet the production and operation of the power system. So it can be used in EMS and DMS and so on.

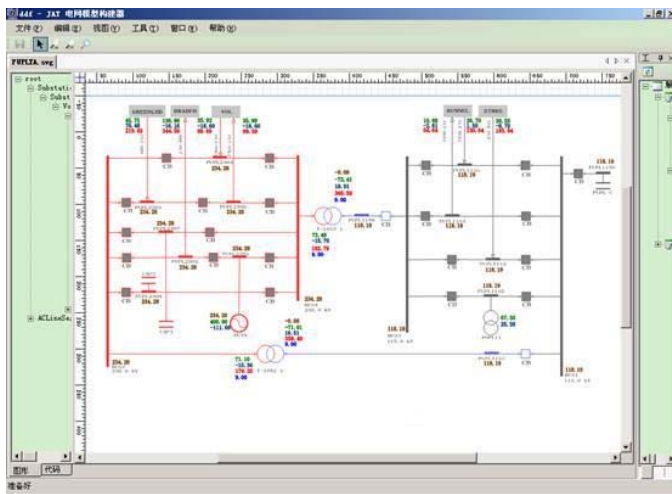


Fig 4 the client of B/S of a power system

The client of B/S mode can be use to the energy measuring system and show the information of power system to public and so on. The cost is very low but the result is good.

V. CONCLUSION

C/S mode requires higher computer performance, expands difficulties, but can ensure real-time. B/S mode requires lower computer performance, easy extension, cannot satisfy the

requirement of real-time sometimes. According to the characteristics of two kinds of patterns and considering the actual demand of electric power system a new method is put forward to that the B/S and C/S mixed mode of electric power system graphic display platform which has the database as the core. Through the analysis and verification, this platform can better meet modern power system graphic display. This method for the development of electric power system graphic display provides new ideas.

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