A New Solution for the Diversify of Network Access Equipment

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Abstract: With various carriers which transmit information arising, they further meet the needs of users. However, they also bring some new problems, such as difficulties in the data communication among devices, data inconsistencies in devices, complexes with application development, etc. This paper presents a new network structure which uses the current mature or existing technology to solve the problems caused by hardware diversity. Using the new network structure, we can reduce data redundancy and data inconsistency, making the distributed software owns a higher availability, reliability and better maintainability.
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1. Introduction

Information is an object [1], it supply a more convenient way for people to access and transmit civilization created by human, promote and enrich interpersonal communications among people. At present, it has played a major role in social life; therefore, we always said that modern society is an information society [2].

Information has such traits as: transformability [3] and transitivity [4]. Transformability means information can be changed or converted by processing it to change form and content for meeting special needs, Information transitivity means the storage of space, transfer or diffusion means the storage of space. People have developed kinds of personal equipments using these traits, for example: PC (personal computer), e-ink book, phone (Smart phone), PDA (Personal Digital Assistant), MP3(Moving Picture Experts Group Audio Layer III) player, PMP(Portable Media Player), PMC (Portable Media Center), PVR (Personal video Recorder), PMA (Pocket Media Assistant), PSP (PlayStation Portable), etc.

Equipment diversity caters to the personal needs of people; they can use .different equipments to view or deal with information at different times, places and moods conveniently. It also results in a number of new problems.

The data redundancy and inconsistencies are the most urgent problems [5-6], the devices with information are amounting, data synchronization between them are further cumbersome, this not only causes data redundancy, but also prone to confusion and inconsistency. For example, a person download a book from the Internet by his office computer, he still hasn't finished the book after work, so he needs to copy this book with annotation to his electronic paper book.

The next day, he needs to synchronize this annotation with PC. This makes people irritable and a slight negligence will cause data inconsistencies between PC and electronic paper book. This example only involves two devices. If using a lot of equipments, he will face many synchronistical operations. This heightens the burden to the user and increases the possibility of data inconsistency.

Different users need to synchronize data with different devices, and different hardware has installed individual software, the software also needs to maintain by users. But these are not the necessities which users have to do, thus reducing the software availability.

Can we find a good network structure to solve this problem? Section 2 presents a network structure, how to achieve its application was discussed in: section 3, section 4 presents the conclusion.

2. The New Network Structure

2.1 Logical structure

Logical structure of the new is shown as below, it consists of three levels: presentation layer, logic layer and storage layer. Presentation layer' corresponds to interface which people can look and feel, the main function of this layer is to interact with user through the use of interactive browser, it's a presentation of information users concern about in a certain way and it provides users with flexible and convenient w4ys to interact. Logic layer corresponds to the logical process, information, data, the existence and levels of this information as well as the relationship between the information. Storage layer is the physical storage structure; it adopts network storage technology to store the information and data with the ability of fault tolerance, transparency and security.

The main features of this logical structure are the separations between the presentation layer and logic layer, storage layer and logic layer.

The related aspects of information are information storage, information processing and information presentation which users especially concerned. They don't want to know the software version in details, from where to read the data, and' how they get final state of information. Therefore, shielding the details of information processing and information storage to make it's transparent to users can improve system availability.

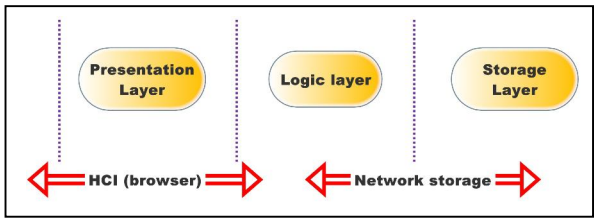

Figure 1. Logical structure

2.2 Physical structure

A user usually has one or more physical devices, one of them owned by one or more users. The program and data in previous physical structure are separately stored in different physical devices. Users take advantage of different physical devices to interact, access information, and update the data or programs on these devices. Information is copied and synchronized between different physical devices through wired or wireless internet network.

On the contrary, users interact with a variety of physical devices in the new physical structure. The main interactive way is that devices present the information through the browser, and users access the program which provided by the program provider on the internet, and then operate the stored data by corresponding programs. Sometimes users can directly access the information stored on the internet through the utilization of browser, update the stored information through a browser after use, edit and feedback. There is a major difference towards previous physical structure for the same logical file or application the previous structure will be in the form of multiple backups on different devices while the new structure has only one physical file which stored on the network.

2.3 Key technologies

Being confined with transmission speed, storage and other technological, previous network can't achieve this structure, but now it is critical to implement this structure with the development of high-Speed transmission and successful application of network storage. The key technologies of network structure are: network storage, network bandwidth and web service.

2.3.1Network transmission speed and security

The current transmission speed becomes faster and faster, next-generation transmission system with 40Gbps has beer commercially used. Anaheim located in California, held Optical Fiber Communication Conference and Exhibition on Nov 2010. Lucent Technologies Bell Labs has announced the first success in the global electronic data multiplexed 107Gbps optical transmission 160Gbps optical fiber communication systems have also been successful in laboratory experiments.

2.4 Advantage of the new model

There are two methods to solve this problem in communication of SNMP protocol and the proxy. In the first method, the proxy can be executed locally on the agent to fully eliminate problems about sending data by using unreliable UDP protocol.

In the second method, the proxy can be connected to the agent through bed of a high speed and secure network. But it cannot be solved problem entirely by this method because the messages must go a part of network by UDP protocol, depending on the proxy and the agent distance.

In fact, the smaller distance between the proxy and SNMP protocol, the lower possibility lacking packages.

2.4.1 Low-cost

The data is stored on the network instead of terminal equipment, one advantage of this is that the efficiency of disk utilization can be improved so that decrease the hardware cost of entire system.

2.4.2 Improve the reliability of the software

Reducing the inconsistency of data, so that improves the reliability of the software.

2.4.3 Improve the usability of the software

Availability sheds light on a set of properties related to individual appraises which combine efforts with a group c: disciplines or implied users. It mainly concludes understandability, learn-ability, and operability.

The new network structure has following advantages: 1. Processing software for each device without having to install; 2. Does not require users to manually synchronize the data thus users can focus more on the business than on the detail of technology; 3. Users do not need to consider upgrading the software or patch for software. They need the results rather than process; they don't want to know too much detail. The internal implementation details are

transparent to the user the method to reduce the burden of user increases the user's ease.

Since different browsers can provide a different view of user interaction, so it can better meet the various needs of different types of users, it's an electronic book which can be presented by their favorite font, black and white style in electronic paper, MP3 can use directly TTL to read for users It also provides visual interaction, auditory interaction, sensory interaction or its synthesis, effectively improving the ability of understanding and learning.

2.4.4 Improve the maintainability of the software

Due to the separation of logic layer and presentation layer, if users want to change needs, programmers only change the presentation layer instead of the contents t of the storage layer and logic layer, which greatly improves the maintainability of the software.

3. Application Examples

3.1 3A Mobile Office

Mobile office is also called 3A office; office workers may at any time (Anytime) any place (Anywhere) processing anything (Anything) with business. Using this model on mobile office business, for example, Mr. Wang use the computer to edit a document in the office, his wife called him to have dinner after work, but this document must be finished today, so he can directly save it, open this document on the subway, it is negligible to consider all the synchronous work and worry about the consistency of document.

3.2 Online document editing

Compared to traditional document editing software, the appearance of Google Docs will dramatically change the way and our habit of using. we will no longer need to install on our PC and other office software, just open the Google Docs web to edit and update documents (Using cloud computing systems), store the documents in personal storage space (Using cloud storage systems). No matter where we go, we can open the saved documents in the cloud storage system after logging on Google Docs. It's easily to share, transmit, and manage copy through the rights management in cloud storage system. Following the Google, Microsoft has introduced online documentation service docs; their most prominent feature is both the program and data stored in remote network.

4. Conclusion

This network has become a trend some software companies have released application. Although previously cited King soft's WPS, Google docs and Microsoft docs, etc. have achieved this structure more or less, not every person or company have recognized that. This paper hope that through clear this architecture in theory, system engineers can design network software with it. We should accelerate this transition between the old and new architecture, making this transition from spontaneous into self-conscious.

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