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The Study of Application System for Small and Medium CTI Based on Voice Card

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Abstract. With the rapid development of computer telecommunications integration (CTI) technology, the development of application system for small and medium CTI are updated constantly, but the study of application system for small and medium CTI, we are lack of a stability and unified model. In this paper, the author analyzes the unified structure platform of application system for small and medium CTI based on voice card. Meanwhile, the author introduces a suitable software architecture model and general procedural framework for application system for small and medium CTI based on voice card by using the idea of hierarchical design, which shows the versatility of the architecture. It provided an efficient channel for the development of small and medium CTI.

1 Introduction

As the rapid development of communication and computer technology in China, it makes that the state intelligence process continues to speed up, so computer Telecommunication integration (CTI) came into being. CTI technology has came to overcome the single drawback of the traditional telecommunications and computer services, it has been used widely in telecommunications, mobile, China Unicom, transportation, postal, banking and other industries, it improved greatly the operational level of the corresponding industries. In the paper the author studies application system for small and medium CTI based on voice card and introduces a suitable software architecture model and general procedural framework for application system for small and medium CTI based on voice card. This voice card as the core of small and medium-scale system is to study CTI application. It is convenient to the research and development of CTI application.

2 A unified structure of small and medium CTI application platform

CTI technology makes use of the advantages of computer information processing，it embodies the characteristics of traffic handling capability for the communication system. The CTI technology can realize the control and comprehensive applications for the voice, fax and data communications, it also offers value-added communication through using telephone communications and computer information processing to make software interface, hardware interface and control equipment integrated[1].The existing application system for small and medium CTI program is convenient to the switch, the advantages of this program is that the system is stable and

it can support large-scale applications, but the design of such systems is complex, meanwhile a unified interface standard is difficult [2], but the use of voice Calgary IPC program, application systems for medium and small CTI can overcome these shortcomings and meet the basic business need.

It is the system unified structure platform of small and medium CTI for all kinds of business needs, the application platform is based on the voice card of CTI applications platform in figure 1.There are some equipments in the enterprise LAN, including CTI server, business server, WEB server, central database, Internet gateways, agents, and some computer peripherals (seat phones, headsets) [3]. The voice card server is the core of the whole system for the small and medium CTI systems which is emphasis on cost. The software systems of servers are installed in this server. Now the CTI application platform not only supports the access of traditional telephone voice, but also including the website construction of B / S [4].

The voice card is the core of the system hardware including the simulation resource cards, digital resource cards, IP resource cards, fax resource cards and other resource cards[5]. The voice card can be used as any single resource card according to the different services in Figure 1, which can also be integrated with several voice resource cards. All kinds of voice cards can be used as PCI / CPCI bus peripherals. There are H.100/H.110 bus connections in these voice cards.

3 Software structure of small and medium CTI application system

In this paper, the author used hierarchical design ideas to shorten the cycle of the application system for small and medium CTI and improve software development efficiency, which has been showed in figure 2. The system software structure is divided into four layers, including the business functions layer, the control layer, the unified interface layer, the physical resource layer. It provides a reference model for the small and medium CTI application system.

3.1 The business function layser

The layer is mainly to achieve a variety of business needs for the system, it loads the appropriate modules and business management modules which is based on the interface layer and control layer, such as artificial agent management, TTS / voice document management, record management , the basic functions of data management and system expansion of other businesses.

3.2 The control layser

The control layer is the core of the system, which is responsible for handling the call control process. The layer is respond to inputting events of the user according to the requests of the user, researching voice process files, routing automatically to the business function module, controlling and scheduling the resources.

3.3 The unified interface layser

The unified interface layer packs further the function of the physical resource layer, meanwhile, it provides users with the relative standard API or a COM object interface. This layer is responsible for providing the state detection (signal tone detection, etc.), receiving double-audio code (dual tone multi-frequency, DTMF), call admission, call control (call setup / disconnect, caller ID extraction, etc.) and digital sound recording and other basic functions.

3.4 The physics resources

The physical resource layer provides mainly the hardware environment of the system, such as analog trunk cards, digital trunk cards, IP resource cards, fax resource cards and other resources cards. The system software is divided into four layers by using the hierarchical idea, which can improve software development efficiency.

4 General program architecture design of small and medium CTI application system

With the exception of telecommunications and other large enterprises, all sectors of society, the demands for CTI applications are mostly small scale, these systems are appropriate to adopt the voice card program. The requirements of application systems for small and

medium CTI are very similar and most of the call center industry is the single application development, so the duplication work is exist, software reuse rate is low, product development cycle is long, feature upgrades is difficult, the stability of the scale is not easy protection. In order to overcome these handicaps, the article presents a general procedural framework. It provides a convenient model for the development of the application system for small and medium CTI. It has been showed in figure 3.

The main program is the core of this program framework, each module is associated with the outside. The reason for this program framework is general is that the developers need only to do one main program for application system for small and medium CTI, then depending on the different needs of CTI application systems, the main work for developers is the business / functional module development, it is no longer need to spend much effort to develop the main program. In addition, this architecture can be used as the application reference model for secondary development of small and medium CTI, and this architecture is suitable for different operating systems and databases.

The process of the main program in the framework is: (1) initializing the device driver and the related resources card; (2) waiting for the accessing of the phone call, recording the number of the time calling, distributing reasonably a channel according to the voice channel of the boards; (3) detecting the call is on-hook or not in time, if it is not on-hook, this call will automatically release the channel resources of the sharing sound cards.

5 Conclusion

The core of the application system for small and medium CTI based on voice card is computer telecommunications integration technology, the author uses the design ideas of hierarchical structure in this paper, the software structure is divided into four layers, separating layers, they are closely related to each other, On this basis, the author design a general structure of program development for the small and medium CTI. The platform has been used the object-oriented technology and increased new features by increasing a collection of objects. We have designed and implemented a public security system and the three-one phone system in a prison by using the above architecture, the designed program structure of the two systems are exactly the same, the current two systems have been applied successfully in the community, the system is stable, practical value is high.

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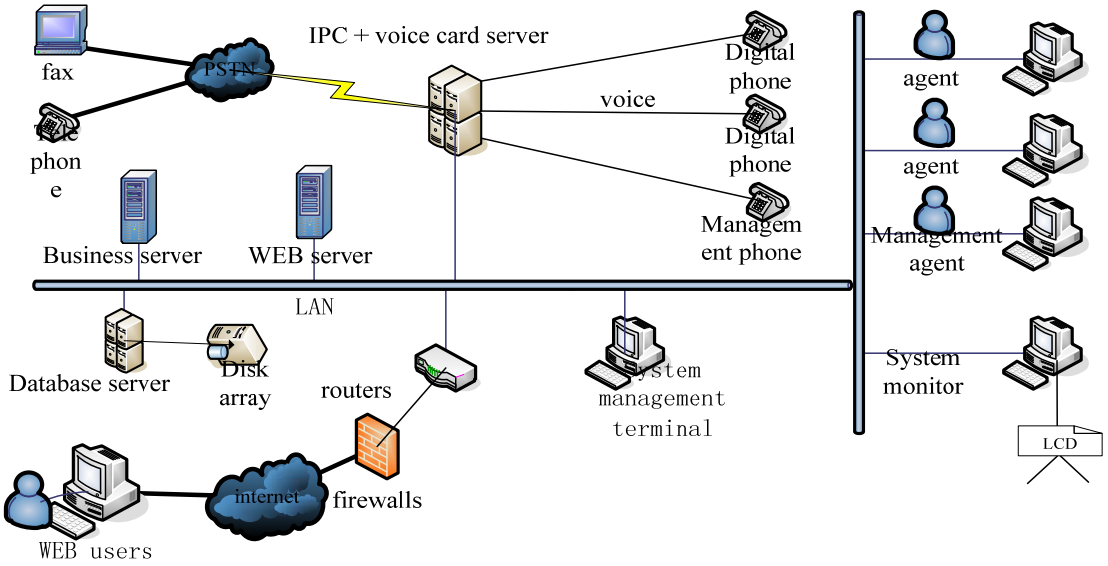

Figure 1. The system Unified Structure Platform of Small and Medium CTI

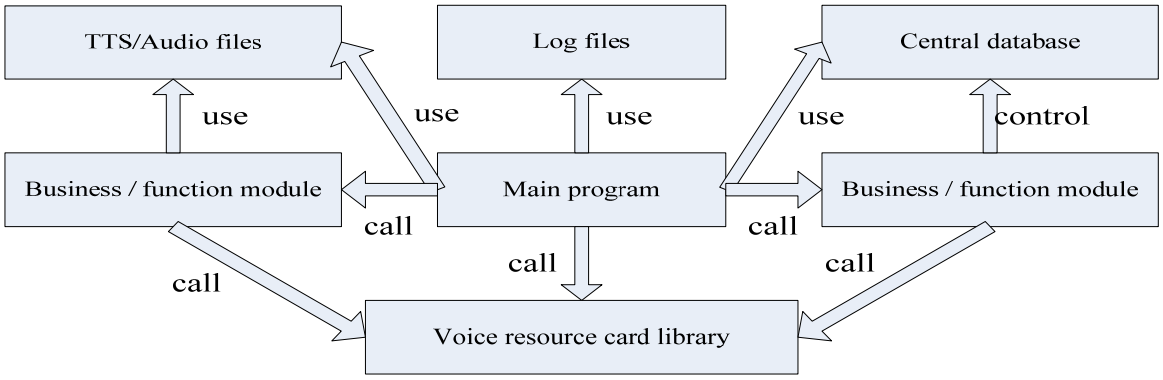

Figure 3. The Program Framework

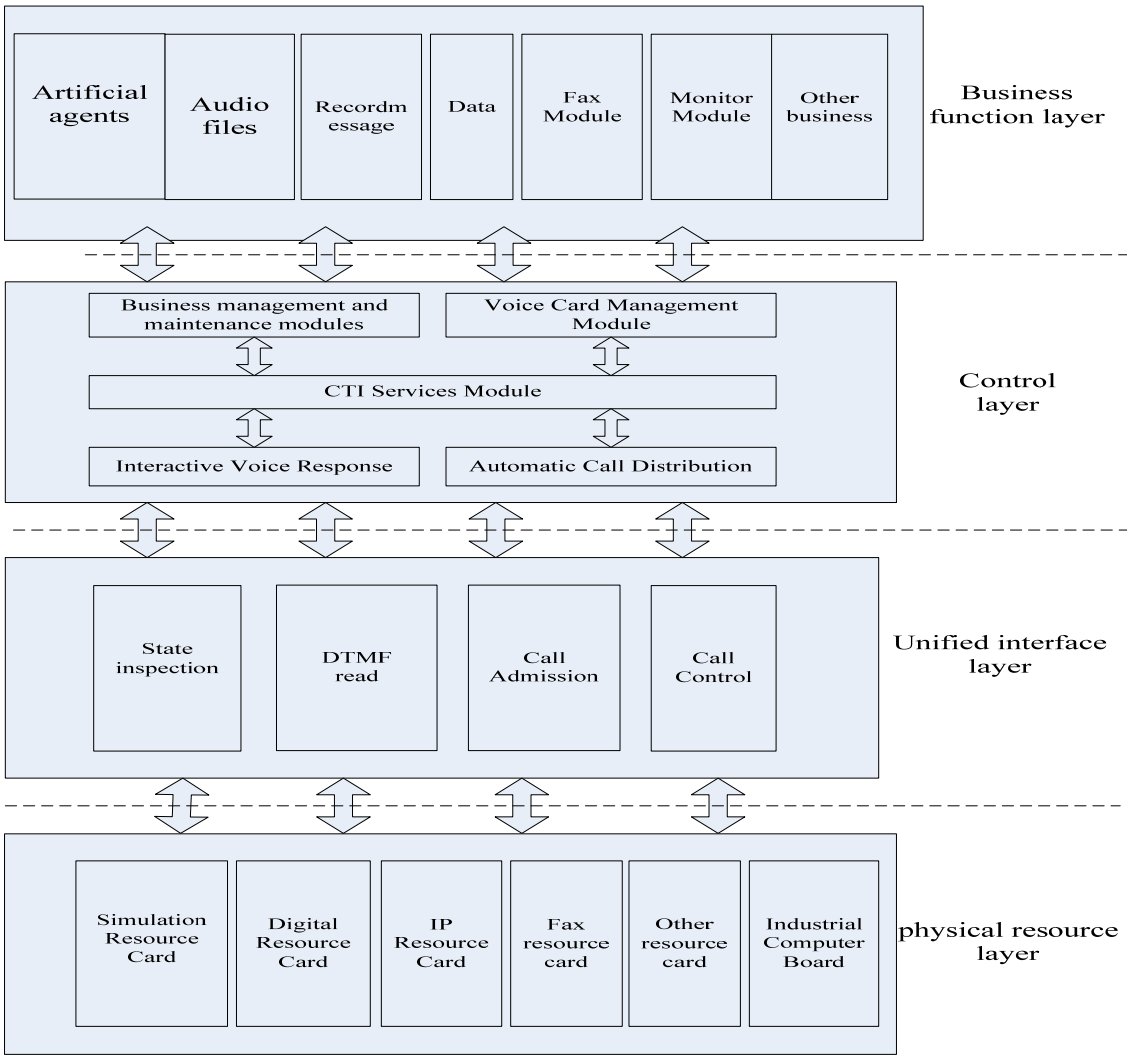

Figure 2. The Hierarchical Structure of System Software