

A Study on the Design and Implementation of Embedded Player SDK

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Abstract: With the fast development of computer technology, people have increasingly focused on that of software and hardware. The embedded player, as one of the normal hardware equivalents, has been paid much attention to the research. While there being some deficiencies, few of the players can support many media with simple user experience. The design and implementation of embedded player SDK is to solve the existing problems. Meanwhile, a good compatibility was quite needed in the design and practice so as to be applied in different system and satisfy users' demands. This paper discussed the details of the design and practice of the embedded player SDK, hoping to help people get a better understanding and be well applied to the application.

1. Introduction

Embedded player products which have advantage over volume, cost and deficiency are related to the development of micro-processing and intellectualize technology. Compared to the traditional computer technology, embedded players adhere the player to the application system by embedding the information to the products or embedding itself into the computer system. Based on the advanced computer technology, embedded players are cut-back in hardware in order to meet the requests such as function, efficiency and consumption, etc., the application system in function, efficiency and consumption.

2. The Concepts and Characteristics of Embedded System

There is currently no set definition of what defines a embedded system on a global scale, while mostly it was deemed as the central of application at the foundation of mature technology. But such players cannot simultaneously apply to other more application systems to match computers' exact needs on such as efficiency, reliability, cost, volume, and consumption.[1] Embedded system dates back to ages of microcomputer, however current users expect much more on microcomputer when the full function cannot be fully accomplished.

Embedded system differs from the general system including following characteristics: firstly, it's based on special application coupling to the Internet. being highly integrate and compact, the embedded system CPU that was designed in specified system for users consumes low power so that improve the mobility because of smaller size.[2] secondly, embedded system is an integrated system that combines computer technology, electrical technology and special application. it's formed by many technical fields which makes it a high technology density and capital density, while in a high dispersion; thirdly, its high efficiency as the basic requirement was quite essential for hardware and software. Taking out the unnecessary parts to realize it's function to a maximum degree; fourthly, there is no independent performance within the embedded system. and for this reason, the developer only extend or modify the system with efficient tools in a special environment.

3. The Components of Embedded System

The kernel of embedded system is embedded MCU, which was integrated in the chip of the task-board so that ensure its miniaturization, high efficiency and reliability.[4] the embedded processor can be divided into two types: Low-embedded Micro controller Unit with all necessary function and peripherals to effectively guarantee the monolithic and micro volume as well as good security

performance; High-embedded Micro controller units are more targeted including computer networking DPS processor and system processors on embedded chip.

Except the central control unit, embedded peripheral equipment also includes storage system, communication system, protective system, debug system and display system. According to the function, it can be divided into peripheral memory, such as Static Random Access Memory, Dynamic memory, etc., interface unit, such as serial port, infrared interface, etc., display, such as LED or touch screen. It is also divided into chip embedded system, including micro controller; template embedded system including Intel X86, Motorola 68K, etc., and system-level embedded system including PC, compatible with embedded PC.[6]

4. The Design and Implementation on Development Kit of Embedded Player

Atomic components is the most significant part of embedded players for being the base of exposing functionality. Atomic component architecture is divided into external interface, initialization function, performance function and data structures. Performance function structure, as an important connection among superstructure, initialization function structure and performance structure can conduct the service of the camshaft during operating the data structure. The designing of the initialization function and external interface can assign the automatic data structures and also maintain a clean and tidy internal structure, or the data structure cannot be operated. Meanwhile, the atomic components must have a good function of protecting the inner structure, which would not be damaged for operational error even without an external program structure.

The implementation of automatic components can be regard as the realization of performance function and play an important hub in automatic components as well as the foundation of a successful operation. The performance function contains five parts:

(1) Message processing module

When the module working, the position of the atoms can be different according to different requirements of processing changes so as to ensure a data processing. If there's wrong information when atoms send messages to the bugs, it would be captured by the procedure, then judged and corrected by the application program.

(2) Automatic port module

As an important connection to the outer space, the atomic port module would create and add different kinds of atomic port according to different demands.

(3) The buffer module

After a long usage period, the buffer module leaves a great deal data accumulation. There must be a wast of storage space if all the data only stored in its own areas. The buffer module is designed to deal with such problems and effectively improve the utilization of the storage space, which can be realized when create a buffer.

(4) Clock Module

The clock module was designed to ensure a well audio and video signal transmission by the time order when setting a clock function.

(5)Bus Module

The bus module is the carrier of message and the base of sending and receiving messages in the atomic components so that to operate the module when provided by bus operation function.

The software development kits of a embedded player, one of the playbacks was based on structures of embedded player that accept and support different formats by replacing the atomic plug-ins.[7] Dynamic loading is a great way of realizing that of implementation, and it could atomically build a pipeline according to the system requirements instead of adding a new application. its functional achieve was rely on MIME(Multipurpose Internet Mail Extensions) and the types of media stream.

MIME(Multipurpose Internet Mail Extensions) is one of a Internet Protocols that transmit the output results to the Internet Explorer and complete the output when the explorer is running a producer.[8] It contains large data category, such as voice and image data; definition category including types of TXT and RTF.

The loading lines or types cannot be recognized when the player functioning well, so the types of the data sources should be clear when decode a different pipeline. The development kits of embedded player can analyze the data flow and send it to all the plug-ins seeking out different types. The operating application will open a pipe to deal with its information as soon as the data flow is determined.

The port property negotiation is composed by property of fixed port, property negotiation of downstream port, and upstream port. The fixed port property is the easiest one to be implemented because of no need of negotiating with outer space, and one fixed port is enough.

The downstream port-property negotiation is set in two cases: There has been built a data receive port at the resources port but was request to connected with other receive ports; Data source port supports a variety of data format and set its functions in any case. The negotiation of upstream data resources has been applied in pipes that support new formats. And it was accomplished when getting the negotiation in the buffer through the data set in the source atomic port.

There are two types of interface: path interface only needs one data source atomic path but with a specific path; overall interface was realized by the application of inserting videos. The application elements provides a graphical window and atomic components to a directly use without creating a new window.

5. Conclusion

The emergence of the embedded system promotes the development of traditional digital equipment benefiting not only on economy but also the the new era of information network. The design and implementation of development kits improve the compatibility of the embedded player and also well adapt to the different application objects, enhancing the users' experience.

References

- [1] Qianyu Lin, The Design and Implementation of the Major Players Based on FLTK, ChongQing Technology and Business University Journal, 03:68-71,2014
- [2] Wang, Liang, Han, Wang, the design and development of the embedded system player, Software Engineer, 06:17-18, 2014.
- [3] Yucong Zhou, The Design and Implementation of Remote-equipped Music Player Applied in Small and Micro-satellite, Chinese New Communication, 21:85-86, 2016.
- [4] Lee, Zhang, Ruan, The Design of Embedded Players Based on DirecFB, Micro-controller and Embedded Systems Applications,03:53-55,2012.
- [5] Chen, Chou,Tang, The Design of HIFI Player Based on ARM Embedded System, Electronic Device, 06:692-698,2016.
- [6] Wei,Hu,Yang, The Design of Multimedia Player Based on Linux,Science & Techno, 31:75-76,2014
- [7] Pan, Qi, The Design and Study on Car Audio Music Playe, GuangXi science & Technology Normal University Journal,05:155-158+38,2015.
- [8] Zhou, Tan A Embedded Interactive System Design Scheme and Its Comparison,Hengyang Normal College Journal,06:44-47,2011.