

Design and Implementation of Remote Push System of Resources Based on Internet

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Abstract. In order to solve the problem of distributing audio and video resources to users better, this paper proposes the design and implementation of remote push system of resources based on Internet. Based on this design, we provide a new method for people to download resources from the remote push platform, which are all on the internet. The experiment also proved the feasibility, reliability and portability of this design.

Keywords: Remote push; platform server; user terminal; work flow

1. Introduction

With the rapid popularization of high-definition digital television, low quality which the traditional audio and video resource shows in the high-definition digital television can't meet the needs of home users. So the task of providing users with plenty of high-definition audio and video resources is extremely urgent. In information age today, the solution of proving users with high-definition audio and video resources through the internet is viable. It will become a method having many advantages and development potential.

Now the internet spreads quickly though our country and there are lots of broadband users. But the mode and efficiency of using broadband is extremely limited. For the monthly subscription users, the effective using time of the broadband maybe has only several hours every day. At other times, the broadband basically is in the idle state. So how to make good use of broadband as to make it easier for users to appreciate high-definition programming is a problem which many manufacturers are considering.

This paper proposes the design of remote push system of resources based on internet in details. The push system of resources includes two parts: push platform of resources and user terminal. The two parts communicate through TCP as to fulfill the task of pushing audio and video resources of server side to the user terminal as in [1].

2. Design and Application

2.1 The general structure

From top to bottom, the architecture of push system is composed of resources provider, push platform, user terminal and basic network provider. As shown in FIG.1.

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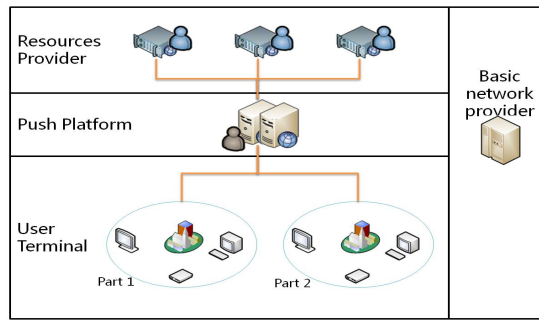


Figure 1. Architecture of Push System

Resources provider registers as resources provider user on the push platform. Then it saves the resources links and other related information to the push platform. It is worth noting that the resources provider user is managed by the platform in a uniform way.

The tasks of push system are basic data maintenance, resources data maintenance and push business completion. All these are operated by platform administrator. The basic data maintenance includes management of various platform users, management of area & terminal account, and management of resources type & classification. The resources data maintenance includes maintenance of resources links and information, screening and activation of resources, etc. The push business consists of packing resources, setting up platform orders and executing push task. The platform also offers the function of monitoring system center. It monitors online state of terminals, condition of executing orders, state of downloading resources, etc, for example [2].

User terminal is a set of software system which is arranged on PC or other proprietary equipment. It works in cross platform mode and mainly realizes receiving of push resources, managing of pushed sources, browsing and playing of resources.

Basic network provider is the fundamental supporting network and executing the transport of resources data.

2.2 The software system architecture design

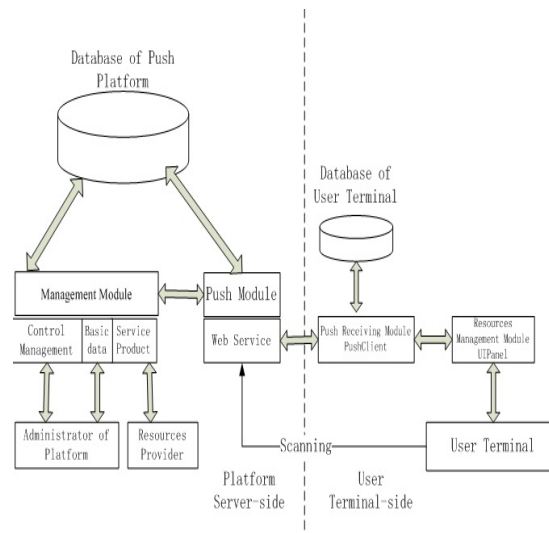


Figure 2. Software Architecture of Push System

The key of the application lies in the design of software system architecture. For the sake of flexibility and expansibility, the software architecture uses modular design. The model of software architecture is shown in FIG.2.

The software of remote push system is divided into two parts: platform server-side software and user terminal-side software. Platform server-side is mainly responsible for the managing user terminals, the interaction between push system and user terminal based on XML, managing and pushing audio and video

resources. User terminal-side is responsible for managing family service terminal, receiving the pushed orders, completing multi-thread download of resources, browsing and playing of the audio and video resources.

1) Platform Server-side Software

Platform server-side software mainly includes three modules: management module, push module and database as in [3].

- Management module provides users with the interface of push platform management platform. Through this interface, platform administrator completes control and managing of push system, maintenance of basic data, etc. Resource provider also adds its own service product to the push platform through the interface. All the operation information will be recorded into the database.
- Push module can communicate with user terminal by invoking web service. The main interface of user terminal includes: identity authentication, push orders query, terminal's state information feedback. Web service interacts with database to provide user terminal with the relevant data or input data to the database.
- Database provides platform software system with a loose coupling support. It is the bridge which links every module.

2) User Terminal-side Software

User Terminal-side software mainly includes three modules: push receiving module, resources management module and user terminal database.

Push receiving module can send request of links and orders query from user terminal to push platform, receive the push data returned by push platform and download push resources. In the module, PushClient is an internally stored program which can self-start along with user terminal. PushClient sends request of link to push platform periodically. Then terminal and platform do authenticating. When the link is authenticated, it will be established. Next, PushClient reads the packed orders through Web Service of push platform and then download the resources provided by resources provider to the terminal storage media.

Resources management module is the interface of user and user terminal software. In the module, UI Panel provides a set of user interface and resources browser and player in order to browse and play the pushed resources as in [4].

User terminal database can record the interaction information between terminal and push platform. It's the foundation which user terminal and push platform can realize the reliable interaction.

2.3 Work flow

1) Work Flow of Resources Provider

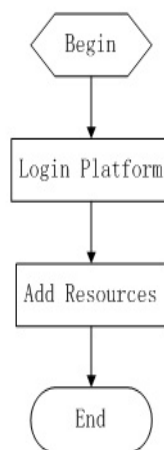


Figure 3. Work Flow of Resources Provider

Resource provider firstly completes user registration on the push platform, logs in the push platform and adds the pushed resources to the service product catalogue of push platform.

2) Work Flow of Platform Administrator

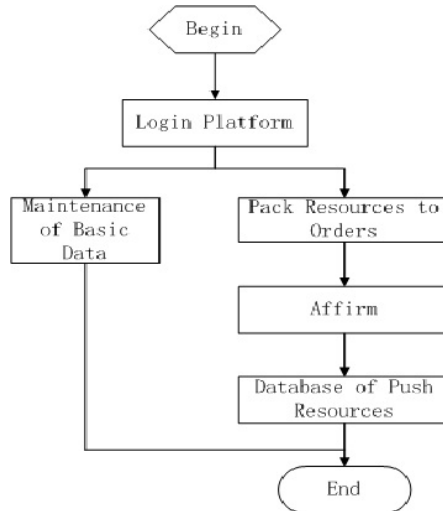


Figure 4. Work Flow of Platform Administrator

Platform administrator logs the push platform, classifies the resources which are provided by resources provider, packs them to orders, affirms them and chooses to push. The orders information will be recorded into the database of push resources.

3) Work Flow of User Terminal

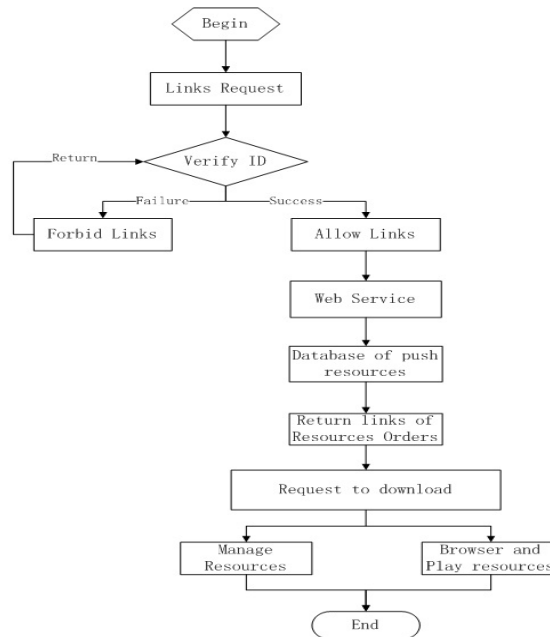


Figure 5. Work Flow of User Terminal

Link user terminal to the network. User terminal can be computer or home gateway, etc. User terminal periodically sends links request to platform server through the Web Service of push platform. Server-side verifies the ID of user terminal. Verified can be permitted to be linked, or will be forbidden and returned. User can use the browser to login the push platform to query orders. When link is established, push and receiving module of user terminal can read the order links returned by the database of push platform as to request resources provider to offer downloading services.

3. Practical Verification

Using this method we realized a remote push system of resources based on internet.

Based on this method of software system architecture, first of all we built a test platform and connected to internet. This platform includes server and platform website system. And then we deployed multi-station

terminals which connected to internet. Then by log-in the push platform of website through the browser, we can push resources to the different user terminals according to their registration information in this platform. At present, we can establish the link between the platform server-side and user terminal-side, and successfully complete the remote push task. The interface of push system is shown as FIG.6.

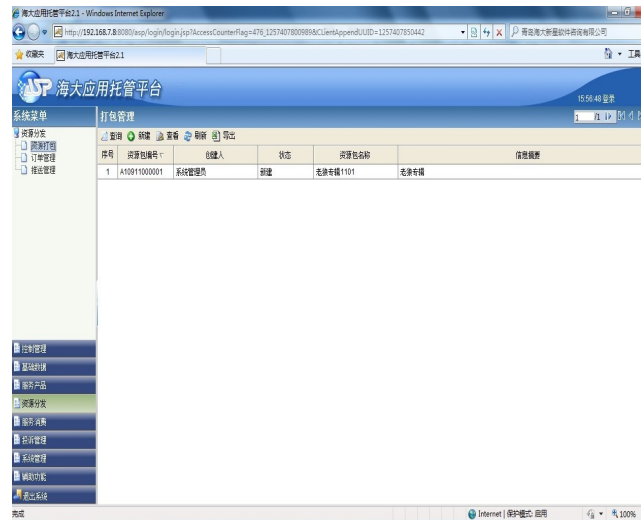


Figure 6. Interface of Platform System

4. Conclusion

This system realizes the remote push system of resources based on internet. Users can receive audio and video resources which are pushed automatically. Push platform and user terminal can complete pushing resources based on the orders. The experiment also proved the effectiveness and feasibility in the laboratory environment, and we will put it into use in our project as our coming work.

5. Acknowledgement

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