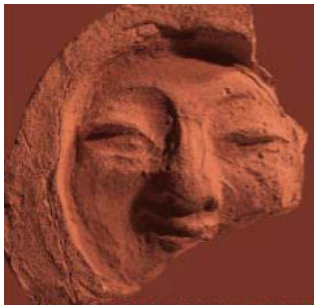

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A Transparent Contents Sharing Service with Virtual Media Server

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Abstract— **The objective of this paper is to propose efficient content control scheme in the home network based on UPnP. To share and control contents efficiently, we propose Virtual Media Server for distributed multimedia contents. To access specific content, a user needs to know the media server's name or location. However by using our proposed server, a user can access the content without any awareness of media server's location or name, because Virtual Media Server provides integrated information such as available media servers, content grouping, etc. This virtual media server is a logical media server, which doesn't have any storage spaces, but it is handled like general media server by other devices of the network. This paper will present the scheme and implementation of the proposed Virtual Media Server between local area network such as home, office and campus.**

Keywords-Contents Sharing, Virtual Media Server, UPnP, Home Network

I. INTRODUCTION

There are various multimedia content as mush as the AV devices are increasing in the ubiquitous home network[1]. The technologies for sharing and controlling the multimedia content are required. The Universal Plug and Play (UPnP) forum defined UPnP AV architecture as the standard of the interoperability of the home network[2]. This architecture allows all kinds of networking devices to join network dynamically and discover automatically.

AV devices as Media Server have many content directories and contents in the directories are controlled by their own ways[3]. Users, who want to play specific content, can access to one Media Server at a time. This means the users have to know the name of server and search the each server to get desired content. This mechanism is not efficient for users. In order to overcome this problem, we propose a Virtual Media Server that makes to search content transparently and supports integrated content directories. Virtual Media Server is a logical media server which acts like general media server in the network, but it doesn't have any storage spaces for media files. It just has the information about distributed multimedia content in the network. And integrated content directory is the common content directory for available Media Servers in the network which is calssified by file type.

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The rest of this paper organized as follows: it starts with related works of the UPnP AV Framework and Media Server. Section 3 presents a scheme and an operation of our proposed system. Section 4 will show the implementation and finally section 5 concludes with future works.

II. TECHNICAL BACKGROUND

A. UPnP AV Framework

UPnP is the communication protocol which can operate and share devices and services in the home network. The UPnP architecture offers pervasive network connectivity between devices including network-enabled consumer electronics equipment, intelligent appliances, portable wireless devices PCs, etc. This architecture makes devices can dynamically join a network, obtain IP address, convey its capabilities, and learn about the presence and capabilities of other devices. The UPnP devices can also leave a network smoothly and automatically without leaving any unwanted state behind.

The UPnP forum released the UPnP Audio Video specification v2 which provides an interoperability infrastructure, it has been working towards to share and play back digital contents from anywhere within home network. The new specification helps to extend the user's experiences by letting them identify and record programs and other digital contents for later viewing.

According to the UPnP AV specification, there are three major components as shown Fig. 1. A media server serves digital contents and transfers them to other devices in the home network. They include DVD players, VCRs, PCs, personal video recorders, CD players, MP3 players, satellite and cable set-top boxes, TVs, etc. A media renderer allows playback of various media formats on the devices such as televisions, PCs, digital media adapters, stereo systems, and personal music players. A control point is the user interface that allows user to discover and operate devices and digital contents to flow between devices.

Each component has own services as shown Fig. 1. One important service of the media server is Content Directory Service which makes metadata of stored digital contents and organized them similarly to file system. As each media server

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