DESIGN AND IMPLEMENTATION OF MOBILE IPTV SYSTEM FOR WIRELESS NETWORKS

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Abstract

In this paper, to use the ubiquitous identifier (UID) support, we develop an integrated identification system and authentication charging through the integrated profile management by providing users information to a service provider even when the terminal moves. Two kinds of wireless manganese moving handover using the FMIPv6 by default and reducing the delay time binding update (BU) further hands over to the terminal. A new network to improve the delay of the process of the FMIPv6-PBU allows the BU to perform in advance provided the handover offers.

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1. Introduction

The major requirement of the user of the multimedia streaming service includes the service (streaming) of broadcasting. TV is currently evolving from a digital TV, a mobile TV take-out (DMB, digital video broadcasting (DVB), etc.), and movement to a new form of IPTV [1-4]. Mobile IPTV service is a new type of extended mobility technology with wireless technology in the existing IPTV technology, and is not limited to any particular wireless technology method. Current IPTV standardization and related technology development are proceeding with the center being for transmitting and receiving high-quality contents, such as SD/HD IPTV through a fixed screen size and with sufficient performance in a stable network environment that supports quality of service (QoS) [5]. Currently, there are many service providers and different types of services. However, users in the future ubiquitous environment through fusion of a terminal will receive a number of services provided as a service. To do this, by building an integrated identification system, authentication system and charging system, the convergence service managers provide necessary services required for fusion [6-9].

2. Design

This section covers the basic research and design for the proposed system for mobile IPv6 and proxy mobile IP.

2.1. Mobile IPv6

Figure 1 shows the structure and operation of a PMIPv6. In MIPv6, MN (mobile node) is assigned a new CoA (care of address). While moving to a different sub-net in one sub-net, it binds with the home address of the MN registered in the HA (home agent). HA registers the allocated CoA in the binding cache (Cache), and continues the service, such as proxy (Proxy) until the end of the binding entry (Entry) of the MN. All packets sent to the home address of the MN are tunneled to the CoA of the MN by the HA. Also, when MN is connected to the new link to create a new CoA, MN becomes able to bind the binding update and the HA receives the packet forwarding address before coming to the home address.
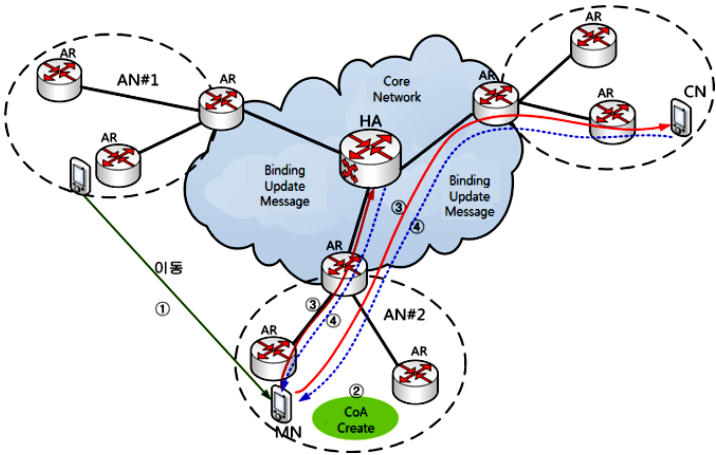
Figure 1. Operation of the MIPv6.

3. Implementation

This section describes the testing environment and component-specific features to demonstrate mobility plan of UID manganese-based heterogeneous wireless mobile IPTV terminal proposed in this paper.

3.1. Mobile terminal testing environments

First, the test environment to demonstrate mobility scheme for mobile IPTV terminals performing in the paper is given as follows. The following Table 1 shows the performance of each component-specific test environment.

Table 1. Function of testing elements

	Streaming server	UID system	Home server	Device
OS	Linux	Windows 2003 server	Windows 2003 server	Windows 7
CPU	Intel Xeon	Intel Xeon	Intel Xeon	Intel Core 2 Duo
RAM	8G	4G	4G	2G
Etc.				Wibro

A sector: Streaming server acts as a service provider server for providing a multimedia stream, such as a smartphone IPTV service. The server provides the streaming service requested by the user via the network.

B sector: Home server provides the service to the user mobility, the algorithm for providing service using a mobile smartphone IPTV service. The user smartphone can be connected to the high speed network. It is provided with a streaming service like IPTV smartphone from the multimedia streaming server.

C sector: UID network system implements UID profile and protocol for providing mobility. While moving, it maintains the log in the smartphone terminal through the communication service provider and receives and serves as the same user.

(1) Streaming server

Streaming: It provides a multimedia streaming service, such as mobile IPTV terminal requesting from.

(2) UID system

The UID protocols and programs for UID-based terminal mobility service system are implemented, by using a service provider in communication with the streaming server which stores the information, position, a buffer status, service and user state of the service, such as receiving and exchanging terminal able to receive the ongoing service.

(3) Home server

By the user ID information, manage the user's location information required for the service management and service mobile support service mobility.

- User ID management integration: Integration management for the identification of the same user ID.

- User terminal management: Management of user terminals using IP addresses.

- User-use information management: Use service management.

- Mobility services: Change user terminal handover support.

- Data transmission: The data processing is transferred to the external terminal.

(4) The terminal

- Network access: It selects multiple access networks.

- Mobility services home server information exchange: The required information exchange and mobility algorithms depending on the home server.

- Data transmission and reception: It requests for services performed as a multimedia server and stream multimedia processing.

3.2. Network configuration and equipment for interoperable verification

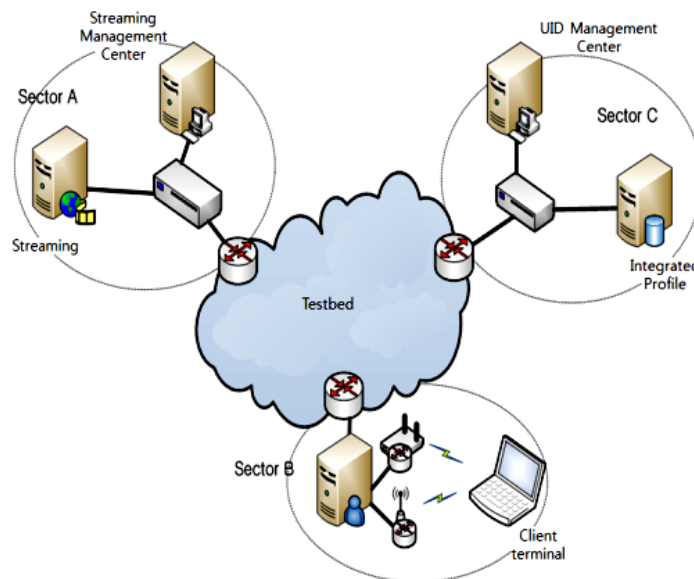Figure 2 shows the system configuration on the network which is also related to a test and verification.

Figure 2. Configuration of the test bed.

3.3. Experiments and discussion

For experiment to ensure that the heterogeneous wireless streaming manganese terminal moves, we derive results as are shown in Figure 3.
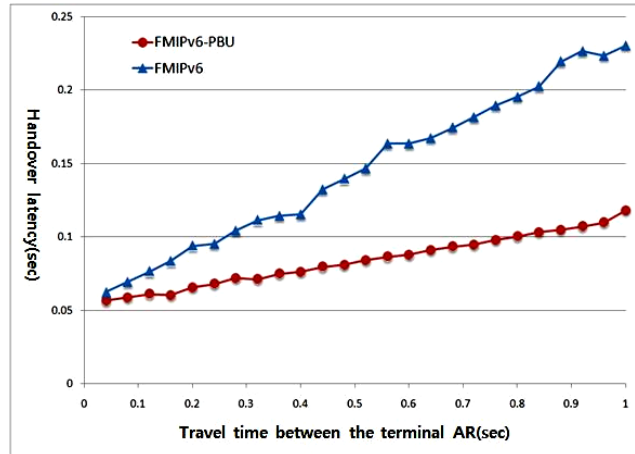
Figure 3. Comparison with handover latency time of round trip between ARs.

As shown in Figure 3, stream terminals may see an increase in the delay time required for handover, while the round trip time increases between ARs. It was found that the movement of AR through which the terminal moved during handover uninterrupted other than the delay. It was confirmed that the terminal smoothly moved. In addition, it was confirmed additionally that FMIPv6-PBU method does not increase the delay time in proportion to an increase in the round trip time. It is a big difference compared to the initial default FMIPv6 methods.

4. Conclusion

In this paper, we analyzed the information required for mobility services in the existing proposed mobility-related technologies and the next-generation network environment as needed is proposed. This plan provides the next-generation of mobile services. In particular, research focused the mobile terminal for a streaming service scheme between the wireless LAN/WiMAX, and proposed a scheme for providing mobility services. Also, proposed scheme home server manages the user information and service information in order to implement the handover and handover control system using the FMIPv6-PBU and the MIH, and service mobility support

for movement confirmation between heterogeneous networks terminals. Mobility procedures and their implementation have been designed for the operation of the user/service information management scheme, and the proposed system. In addition, the proposed technology can be utilized as the basis of field research as a technology for the commercialization of the Internet streaming services such as future service mobility and mobile IPTV services as a key technology for providing two kinds of manganese mobility in the next-generation network environment feed.

Acknowledgement

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