The Architecture of Tool server in MPEG-21

KwangYong Kim, JinWoo Hong, JinWoong Kim

Broadcasting Media Technology Department, ETRI, KOREA

{kwangyk,jwhong,jwkim}@etri.re.kr

Abstract—This paper presents the role and its function of Tool server. MPEG-21 means multimedia framework for delivery and consumption of multimedia which is being discussed in ISO/IEC 21000. A view of MPEG-21 aims to define multimedia framework to enable transparent use of multimedia resource across a wide range of networks and devices used by different communities. MPEG-21 will enable all-electronic creation, delivery and trade of digital multimedia content and transparent usage of various content types on network device. Therefore, we can provide access to information and services from almost anywhere at anytime with various terminals and networks. In order to support multimedia delivery chain that contains content creation, production, delivery and consumption, we need many standards(elements) for identify, describe, manage and protect the content . Thus, we define Digital Item Player(DIP), Digital Item Adaptation(DIA) server and Tool server as primary objects of MPEG-21 multimedia framework. DIP provides a function which creates and consumes Digital Item(DI) as a kind of a digital object by user . A DI contains both media resources and metadata including rights information. DIA server deals with the usage environment description schema of the user characteristics, terminal and network characteristics and natural environments. DIA server adapts the original DI to the usage environment description sent from the terminal and transmits the adapted DI to the terminal. Tool server searches for a tool requested from DIP or DIA and downloads the best tool to DIP or DIA server. In this paper, we present how Tool server is organized and is used among 2 primary objects. The paper is structured as followings: Section 1 briefly describes why MPEG-21 is needed and what MPEG-21 wants. We see requirement that tool server must equip functionally in section 2. The proposed tool server ,its structure and its functionality are presented in section 3. Section 4 explains a scenario that tool server transmits tool to DIP and shows the experimental result. The paper concludes in section 5.

Index Terms—DIP, DIA server, Tool server, Tool list manager

I. INTRODUCTION

Today, multimedia users create, distribute and consume multimedia contents using various device. But, if user want to consume contents, user must utilize suitable player or suitable CODEC in contents format. Lately , method to protect contents that is dealt with unlawfulness circulation exists variously .Thus problem is that there is no service Framework of international standard to provide multimedia service.MPEG-21 will enable all-electronic creation, delivery and trade of digital multimedia content and transparent usage

of various content types on network device. So, we can provide access to information and services from almost anywhere at anytime with various terminals and networks, Finally, MPEG-21 aims to define multimedia framework to enable transparent use of multimedia resource across a wide range of networks and devices used by different communities[1][2][3]. DIP(Digital Item Processing) acts role that create or consume multimedia contents in MPEG - 21 services Framework.[4]. DIP creates digital item and consume it. We call Digital Item into DI breifly. DI becomes object that run generation and consumption by user here. DI has structured object including media resources and meta data[1][2]. Therefore, several DIPs exist and these communicate contents in form of DI. Also, one important object is DIA (Digital Item Adaptation) [4]. DIA takes charge function that fit digital item to be suitable in user special quality in delivery of digital item, terminal and network environment.. DIA describes adaptation method and metadata for media resources for adaptation of DI, and controls QoS (Quality of Service) to secure quality of service.
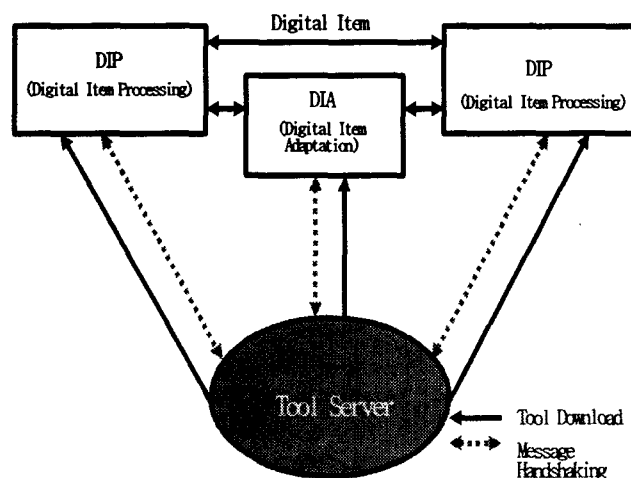

Fig 1. A inter-relation with DIP ,DIA and Tool server

But, DIP and DIA must have suitable tool to create and

consume DI in terminal. Tool exists variously according to the usage and type of supported tool. It Is difficult for DIP or DIA to manage various tools supported into usage and type of a tool thus. We must do to manage tools that DIP wants in special tool server. And tool need to be downloaded to DIP by tool server. While do work that DIA adapts about media resources, but tool server does work that fit drive environment about a DIP. That is, a tool server supplies suitable tool in terminal, operating system environment, and computing environment to DIP and DIA. Next Figure 1. is a relational diagram that shows inter-relation with DIP, DIA and a tool server.

II. REQUIREMENT OF TOOL SERVER

A tool server must be able to find a tool that DIA and DIA need and supply searching tool. first, Let's examine the role from a viewpoint of tool creator. A tool server must be able to register and supply a tool ID for a tool created newly through tool registration authority. Also, a tool server must have license offer function that can give usage right of a tool. This is purpose to give authority that can use tool to a lawful user. We download tool so that tool may can become plug-in at the terminal interior registry. Network protocol consists of TCP/IP networking because may not require real time. Specially, the missing tool that is omitted in tool server must be able to supply URI information of other tool server. Here, other tool server must be server that is verified by Certification authority (CA). A tool server needs key issuance function to offer key that is connected with a tool ID and the license. Second, let's recognize from tool administration's viewpoint. A tool server must be able to supply a suitable tool in user environment in tool list about a tool that DIP requires. A tool server needs the protection from outside hacking and infection of virus. Third, we examine in side of a tool distribution. A tool server must be able to register copyright information and sale contract information for billing and payment settlement processing. A tool server must be able to record loyalty division details to divide Royalty properly. Finally, Let's examine from the viewpoint of tool consumption. A Consumer needs account that can pay a fee at offering a tool. A tool server needs the payment way such as internet banking, electron wallet etc. Specially, Information that is registered to registry by Plug-In way must be able to

supply a suitable tool by automatic sensing and must be able to make a query to a tool server when a tool server needs the user optional information like Operating System type

III. THE STRUCTURE AND ITS FUNCTIONALITY OF TOOL SERVER

A tool server can classify to three parts greatly. Figure 2 shows the architecture of a tool server.
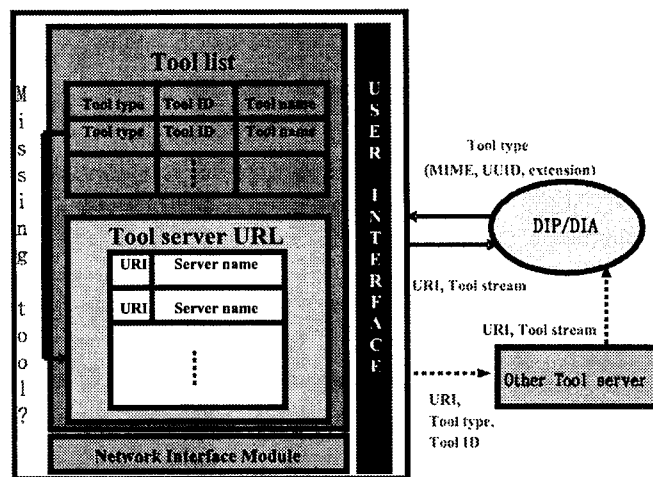

Fig. 2. The architecture of a Tool server

Each module structure and function are as following. First module are User Interface module. This module exchanges message mutually for Tool downloading between DIP, DIA and a tool server. A tool server sends a tool stream that DIP or DIA requires. Input becomes query information and tool request information that DIP or DIA requires. Information sensed automatically at Plug-In registration becomes MIME, UUID, and extension. The user optional information becomes media size, profile level, media type and O.S type that are used in a terminal. The output gets into search result that find in retrieval lists and becomes tool's source URI for down loading. Second module is the Tool list Manager. This is D/B that creates tool ID and it stores, searches, deletes and manages a tool by a tool type. The Tool list manager has found the most suitable tool using automatic sensing information and user option information. If a missing tool exists in a tool server, The Tool list Manager can search URI list of other tool server that is registered already and supply a tool. Finally, third module is the Network Interface Module (NIM). The NIM runs network connection for exchanging message among DIP, DIA., and a tool server. And also, it runs network connection to deliver the tool stream. The NIM

transmits error message if error happens while transmit using TCP/IP networking..

IV. A SCENARIO FOR TOOL TRANSMISSION

This section explains scenario that tool server transmits tool to DIP. Figure 3 shows a tool transmission scenario.
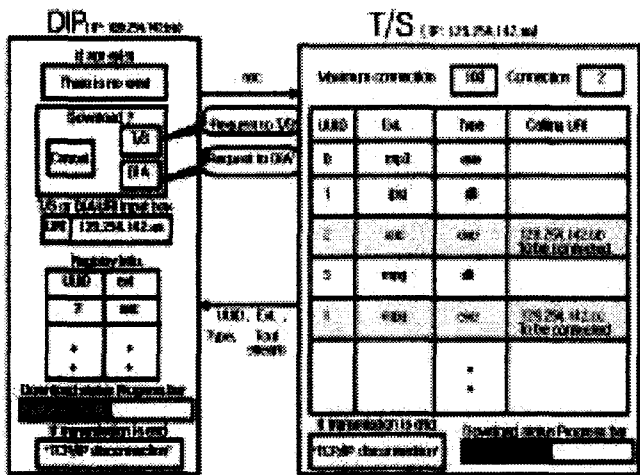

Fig.3. A scenario for tool transmission

A Scenario is as following. First, a user plays aac media in RunListening-Practice that is made by Digital Item(DI). Here, DIP manages media list that play is possible itself (for example, mpeg, avi, mp3, aac etc.). A playing of media is executed in PlayAsync that is one of Digital Item Basic Operator(DIBO), A DIP judges whether playing is possible before playing. Here, A Tool server judges if a playable decoder exists to DIP sensing extension of media file. If A DIP have playable decoder, A DIP plays aac media immediately. But, if this does not have playable decoder, a message of 'There is no exist' appears to a user. If a user clicks the 'O.K' button in this message, another dialog box that is displayed as 'Download ?' appears to a user. But, if user clicks 'Cancel' button in this box, message of "No Playing" appears and play is stopped soon. If a user clicks the 'O.K' button in this box, a dialog box that select one of a DIA and a Tool server appears to user. If a user clicks 'T/S' button, dialog box that is displayed as 'Request to T/S' appears to the user. But, if a user clicks 'DIA' button, dialog box that is displayed as 'Request to DIA' appears to the user. Therefore, a user clicks button that is marked as 'Request to DIA' and inputs the URI of Tool server. A tool server retrieves registered tools using

sensed extension's information. But, if a tool is not in this tool server, at DIP and a tool server display the message that is marked as 'Not Finding Tool' and DIP stops media playing soon. If there is a tool that a DIP requires, a tool server displays a finding tool by highlight and records the calling URI. If a tool transmission is begun, the message window of a DIP and a tool server displays the progression state that is marked as 'Tool downloading'. If a tool transmission is completed, a DIP and a tool server displays the message window that is marked as 'TCP/IP Disconnection'. After a DIP registers a Tool to the registry, a DIP plays the aac media. The following shows the experiment result that be implemented according to described scenario in front. Figure 4 shows an interior structure of tool server for test-bed.
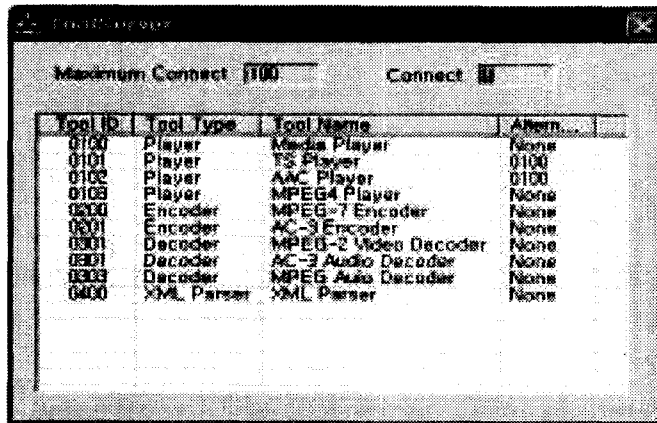

Fig.4. An interior structure of a Tool server for testbed

Here, the number of maximum connection appeared as 'Maximum connect' and the client's number which is connecting present marked as 'Connect'.
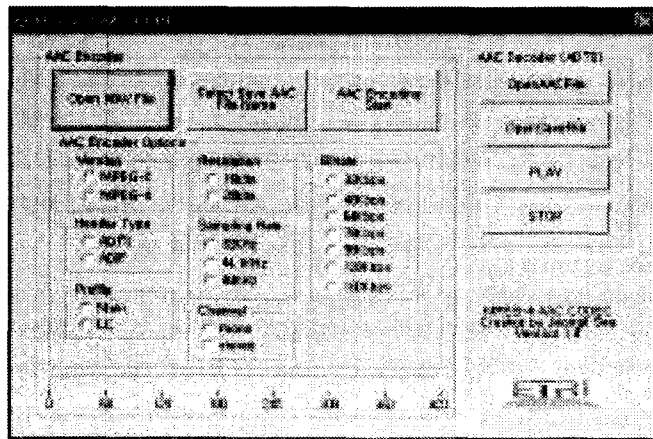

Fig.5. A codec.of aac media

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As shown in figure 4, a tool type is managed classifying by player, codec, parser, etc. As see in figure 5, the DIP uses the transmitted tool codec. And it can play aac media.

V. CONCLUSION

We examine the necessity and the role of tool server ,and also see its architecture in MPEG - 21 environments so far and we knew the function in each module. When we see from viewpoint which user consume a tool, a tool server must do intelligent as can support automatically suitable tool in use' s environment. If we see in side that a tool server also manages tools, when a user requested a necessary tool, a tool server must be able to act role as a systematic administration server that must be able to retrieve the most suitable tool and can secure from external intrusion. If we observe in side that a tool server supply a tool, a tool server needs a tool ID registration function to identify a tool and does a tool authentication function that can verify a tool. If the Multimedia Framework is implemented so that interoperation may be possible among a DIP, a DIA and a tool server that support them, the integration multimedia service is available. So, we are expected to be utilized broadly in various multimedia service to applications such as on-line picture album, the digital library, on-line travel package, a computer game, VOD service and the broadcasting system through MPEG-21 multimedia Framework.

ACKNOWLEDGMENT

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