Chapter 6   Conclusion

IPMP-X defines one of the processing chain in the DRM systems. Its purpose is to define a compliant terminal platform such that for various terminal systems there is a consistency usage environment for the right associated with content. This will provide the DRM system and manufacture have a standard to follow and guarantee its interoperability

The content of this thesis is divided into three major parts:

(1)   To understand MPEG4 IPMP-X Specification

IPMP-X defines a set of mutual authentication messages that can be used to verify the trust of IPMP Tools/Terminal, and provides a secure channel for the exchange of messages between any pair of IPMP Tools or between IPMP Tools and the IPMP-X compliant terminal.

MPEG-4 IPMP-X architecture is a secure communication interface. The characteristics are as follows:

1. Message based using a communication interface

2. A conceptual component of the Terminal, the Message Router (MR) plays the role of receiving and delivering from tool to tool and from tool to terminal messages.

3. Supports the design and use for any type of tool.

4. Supports the placement of tools at arbitrary control points

5. Supports Mutual Authentication of and between tools.

6. Supports the delivery of tools in the bit stream.

(2) How to implement action of MPEG4 IPMP-X supported by IM1 System.

IPMP-X Software Reference for its implementation includes a few key components. The major key components contain Message Router, Tool Manager, Control Point and Tool Framework. Message Router and Tool Manager interface is an abstract class. The software reference uses polymorphism technique of Object Orientated Language to implement Message Router and Tool Manager .

The Software Reference creates threads to implement the Control Point function that receives input stream and transfers the stream to the specified tool. After the tool module is implemented, the Control Point transfers the stream to next level.

There was still no tool available in the reference software to allow the embedding elementary streams of IPMP Tool Stream. So, currently, the Software Reference version is only considered the tool module embedded in the terminal. The Software Reference provides the tool framework for the developer to develop application programs.

(1) Implement Application based on MPEG4 IPMP-X

1. We simulates two applications of real world to use IPMP-X framework, one is Digital TV conditional access application ,and other is DVD copy protection application.

    (a)   Digital TV conditional access

A conditional access system comprises a combination of scrambling and encryption to prevent unauthorized reception. Encryption is the process of protecting the secret keys that are transmitted with a scrambled signal to enable the descrambler to work. The scrambler key, called the control word is sent to the receiver in encrypted form as an entitlement control message (ECM). The CA subsystem in the receiver will decrypt the control word only when authorized to do so.That authority is sent to the receiver in the form of an entitlement management message(EMM).

We divide this application into two part: one is the sender, the other is receiver. Currently, Our system is standalone. The sender is as the file form(*.trif) to feed information to the receiver. The major work of the receiver is to develop a conditional access tool module to decrypt encrypted content and descramble scrambled content when authority is right.

(2) DVD copy protection

The copy protection system broadly tries to prevent illicit copies from being made from either the analog or digital I/O channels of DVD recorders. Several watermark applications that are currently in place or very close to being released were discussed. We only focus on the watermark detector for DVD copy protection. The watermark detector is as a tool module on IPMP-X system to detect whether DVD can be copied depending on mark.

(3) We explain and trace a software reference code supported by IM1. The software reference code is about MPEG-21 Right Expression Language in a MPEG-4 IPMP-X. Future, we will extend to MPEG-21 Right Expression Language and

MPEG-21 IPMP based on this foundation. We will extend and implement application

of the MPEG-21 Right Expression Language and MPEG-21 IPMP in the future.

IPMP-X provides place holders for any rights language. As such, MPEG-21 REL

can fit in. This example explains how an MPEG-4 IPMP-X terminal can use a set of

IPMP tools to enable REL-License based rights management.