Executive Summary

This is the first-half of the second study report of the TC-30MR study group on UMID applications.

The UMID (Unique Material IDentifier) is a globally unique audiovisual material identifier standardized by SMPTE as SMPTE ST 330 and RP 205. Although more than a decade has passed since its initial standardization in 2000 and it has been widely disseminated over the industry by audiovisual products using the MXF and AAF technologies, its originally intended use as a unique material identifier to associate the material with its external metadata has seldom been seen in practice.

It has been revealed in the literature that this is because of lack of additional technologies needed to be industry standardized to realize such UMID applications. To address this issue, TC-30MR study group on UMID applications has been established last on April 2012 with the project scope as:

1. To explore the best practice of UMID applications,
2. To identify typical UMID application principles and collate the fundamental rules every UMID-aware product needs to adopt,
3. To identify relevant technologies needed to be additionally standardized.

In this second study report, the third items of the project scope are discussed.

Specifically this first-half of the second study report proposes the following two technologies as the ones needed to be additionally standardized to enhance the UMID applications.

- UMID Resolution Protocol (Section 2)
- UMID based Program Package Exchange (Section 3)

and the second-half of the second study report, which should come shortly, will additionally proposes the following technology as the one (at the time of this writing)

- UMID Applications in MXF

Finally, in order for the outcome of this report to be implemented as relevant SMPTE standard documents, a setup of a new project for each technology is recommended as a conclusion of this study report.
# Table of Contents

1. Introduction ................................................................................................................................................................ 3

2. UMID Resolution Protocol ......................................................................................................................................... 4
   2.1 What is the UMID Resolution Protocol and Why is it Needed? ........................................................................... 4
   2.2 Requirements of UMID Resolution Protocol ........................................................................................................ 4

2.3 DNS (Domain Name System) and DNS-based Service Discovery .............................................................................. 5
   2.3.1 Introduction ................................................................................................................................................. 5
   2.3.2 What is the Domain Name System (DNS)? ................................................................................................ 5
   2.3.3 DNS Resource Records .............................................................................................................................. 6
   2.3.4 What is the DNS-based Service Discovery (DNS-SD)? ........................................................................... 14
   2.3.5 DNS-SD Design, Implementation and Examples ..................................................................................... 15
   2.3.6 DNS RR Types for DNS-SD ..................................................................................................................... 16
   2.3.7 Example DNS-Based Service Discovery Using "nslookup". ...................................................................... 18

2.4 Study of DNS-based UMID Resolution .............................................................................................................. 19
   2.4.1 Introduction ............................................................................................................................................... 19
   2.4.2 Implementation of DNS-based UMID Resolution ..................................................................................... 19
   2.4.3 UMID Resolution Examples ...................................................................................................................... 24
   2.4.4 What Needs to be Standardized by SMPTE?........................................................................................... 31

3. UMID based Program Package Exchange .............................................................................................................. 34
   3.1 Objective ............................................................................................................................................................ 34
   3.2 Use Case Scenario ............................................................................................................................................ 34
   3.3 Requirements of UMID based Program Package Exchange ........................................................................... 35

4. Recommendations ................................................................................................................................................... 36