Introduction to UMID and its Applications

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Outline

- What is the UMID?
- UMID Application Basics
- UMID Application Principles
- UMID Resolution Protocol
- UMID Applications Specifically for MXF
- Summary
What is the UMID?

- **Unique Material IDentity**
  - Specified by SMPTE ST 330 and RP 205

**“Origin”**

**“Standards”**

**“Implementations”**

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UMID Format

- Based on Key-Length-Value Encoding

![Diagram of UMID Format]

- **UL**: SMPTE Universal Label (Key)
- **L**: Length of Value part in byte (Length)
- **Inst.#**: Instance Number
- **Mat.#**: Material Number (Globally Unique ID)

\[\text{Value} \]
Two Distinct Uses of the UMID

- As a unique identifier
  - New value for **Mat.#**
  - Zero for **Inst.#**

- As a linking tool
  - Shared value for **Mat.#**
  - Non-zero for **Inst.#**

These uses are mutually exclusive!
UMID as a Unique Identifier

- To associate an AV material with its metadata

<Metadata xmlns="...">
  <TargetMaterial umidRef="UA"/>
  <Title>Major League Baseball</Title>
</Metadata>

AV Material (1) → Metadata (1) → Metadata (2) → Metadata (3)
UMID based Material Search

- Because of huge difference in their data sizes ...

- It is "UMID='UA'" MXF file.
- Which MXF file captures "Ichiro Homerun"?
- Where is "UMID='UA'" MXF file?
- I have it at "http://.../ichiro.mxf"!
UMID based Material Search

- Because of huge difference in their data sizes ...

**Needs industry common “UMID Resolution Protocol” for ③ and ④**

- Uniform management of metadata associated with MXF files via UMID

- "UMID='UA' MXF file?"

- "Where is "UMID='UA' " MXF file?"

- "Which MXF file captures "Ichiro Homerun"?"

- "UMID='UA' MXF file."

- "I have it at "http://... /ichiro.mxf"!"
When Generalized

- Can be divided into two distinctive layers
When Generalized

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When Generalized

- Can be divided into two distinctive layers
  - **UMID realizes “Loose Coupling” between them!**

![Diagram showing the division into two layers: (Workflow) Application Layer and Media (Manipulation) Layer. Dynamic links via UMID are indicated.]
To Make it Happen in Practice

- Needs industry common **UMID resolution protocol**
  - To resolves a given UMID of AV material to its URL

- Specifies **UMID Application Principles**
  - To achieve consistent UMID based material management independent of vendor products
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What are They?

- **Principle A: UMID Integrity**
  - Different AV materials shall be identified by different UMIDs

- **Principle B: UMID Identification**
  - AV materials representing an identical result at their playout may share the same UMID
UMID Managed Domain

- Embodiment of “UMID Application Principles”

Material 1, 2, 4 and 5 constitute “UMID Managed Domain”
FCD RP 205

- Specifies
  - UMID Application Principles

- Describes
  - How to implement UMID Managed Domain
  - UMID Application Examples
  - FAQs

- Status
  - Under ST Audit

  • To be published shortly!
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Requirements

- Must provide a method for a given UMID to be converted to the URL of a material.

- Should provide basic technical information of a material together with the URL so that an application can judge its playability in advance.
DNS (Domain Name System)

- Conventional (Unicast) DNS
- Multicast DNS (Zeroconf)

For Domain Name Resolution (Done for any Internet access)

For Service Discovery (Adopted in ST 2071–3)
Preliminary Experiment

- Using “BIND” (Server) and “nslookup” (client)

```
C:\>nslookup -type=txt 0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdf.umd.udp.local 127.0.0.1
Server: localhost
Address: 127.0.0.1

0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdf.umd.udp.local text =
  "dur=60"
  "depth=10"
  "sample=422"

0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdf.umd.udp.local text =
  "url=http://ingSrv.local/20130831/sports/file5.mxf"
  "codec=j2k"
  "wrapper=mxv"

local nameserver = ns1.local
ns1.local internet address = 127.0.0.1

C:\>
```
Study Report Part 2–1

- Describes
  - Requirements
  - DNS Basics
  - DNS–based UMID Resolution
    - incl. What SMPTE needs to standardize

- Status
  - Based on the report, a New Draft Group has just set up
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MXF Internal Behavior Model

- What is obtained at playout is NOT always the same as what is inside an MXF file

- UMID attached to FP and MP!
For Partial Retrieval

- Thanks to the “MP” and “FP” layered structure

- Both “UMID as a unique identifier” and “UMID as a linking tool” are accommodated in MXF!
Study Report Part 2–2

- Describes
  - MXF Internal Behavior Model
  - UMIDs in MXF
  - App. Material Package UMID
  - App. File Package UMID
  - App. UMIDs in MXF Essence Container

- Status
  - To be submitted to SMPTE Geneva Meeting (Sep. 2014)
    - Relevant Drafting Group set up to be proposed
Summary

- **FCD RP 205**
  - UMID Application Principles, UMID Managed Domain, UMID Application Examples
    - [https://kws.smpte.org/kws/groups/30mr/ballots/ballot?id=1687](https://kws.smpte.org/kws/groups/30mr/ballots/ballot?id=1687)
  - FAQs

- **Study Report Part 2–1**
  - UMID Resolution Protocol
  - Draft Group

- **Study Report Part 2–2**
  - UMID Applications Specifically for MXF