



Introduction to UMID and its Applications

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Chair, SMPTE TC-30MR SG UMID Applications

<https://kws.smpte.org/kws/groups/30mr-umid>

(metaFrontier.jp, LLC)

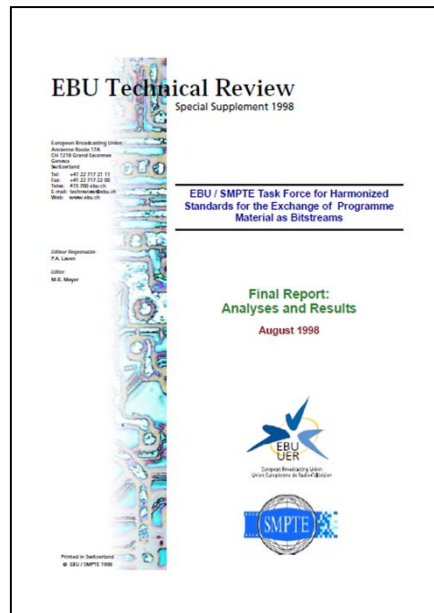
Outline

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

What is the UMID ?

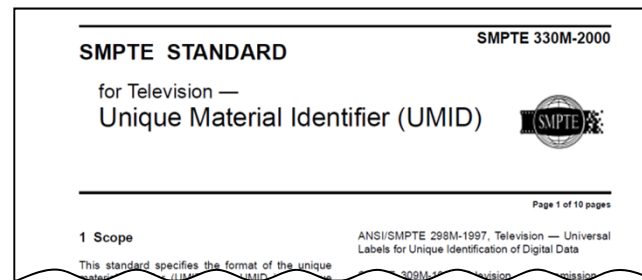
- ▶ Unique Material IDentifier
 - Specified by SMPTE ST 330 and RP 205

“Origin”

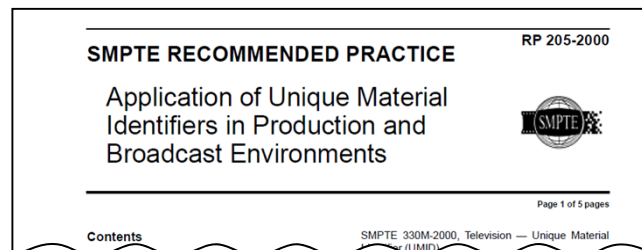


Final Report on
“EBU / SMPTE Task Force for
Harmonized Standards for
the Exchange of Programme
Material as Bitstreams”
(Aug. 1998)

“Standards”

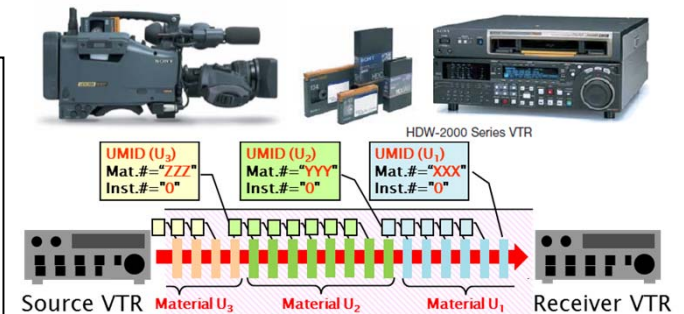


SMPTE 330M-2000

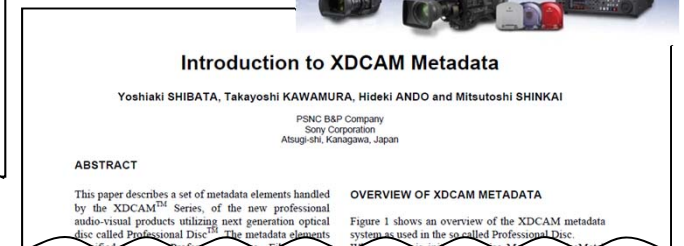


SMPTE RP 205-2000

“Implementations”



Initially supported by “HDCAM”



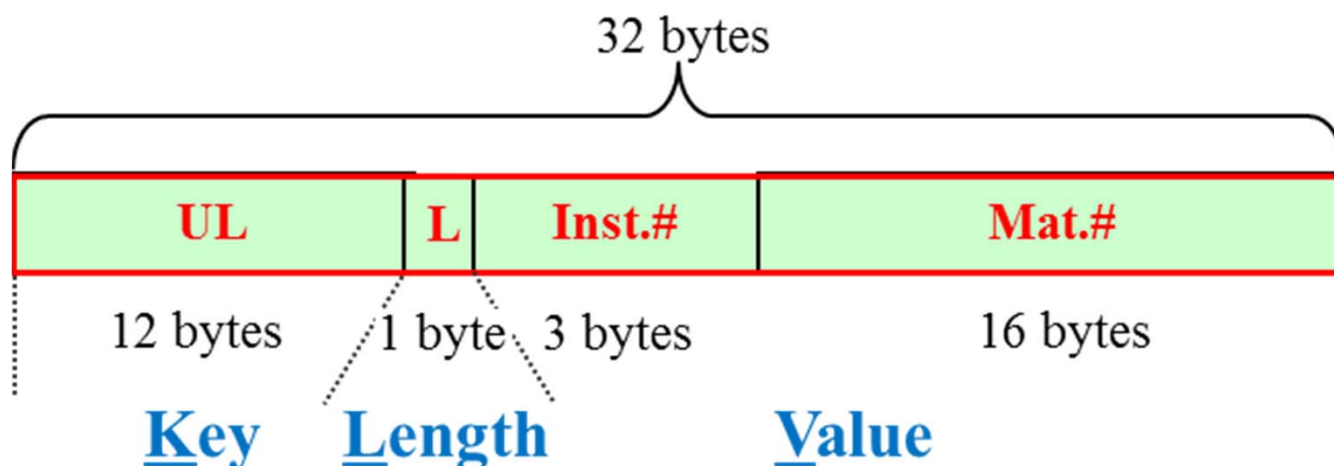
“Introduction to XDCAM Metadata”
in NAB 2005 BEC

Outline

- ▶ What is the UMID?
- ▶ **UMID Application Basics**
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UMID Format

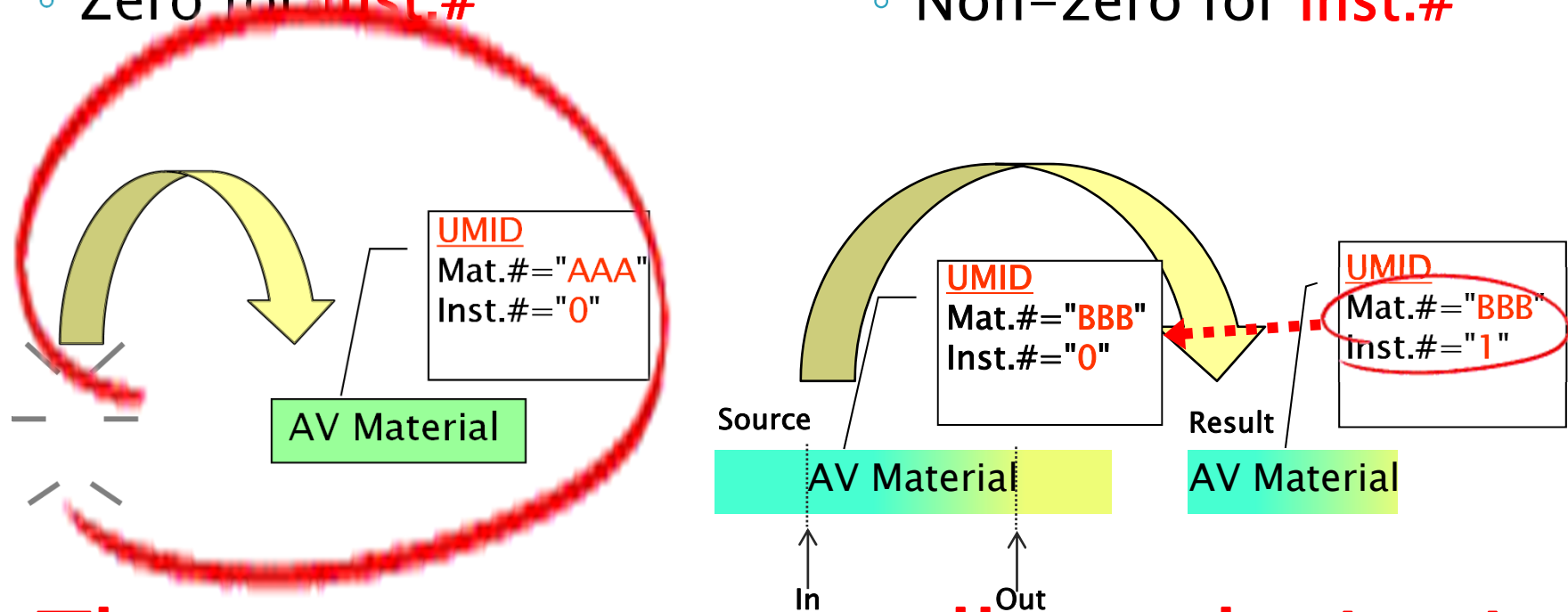
- ▶ Based on Key–Length–Value Encoding



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

Two Distinct Uses of the UMID

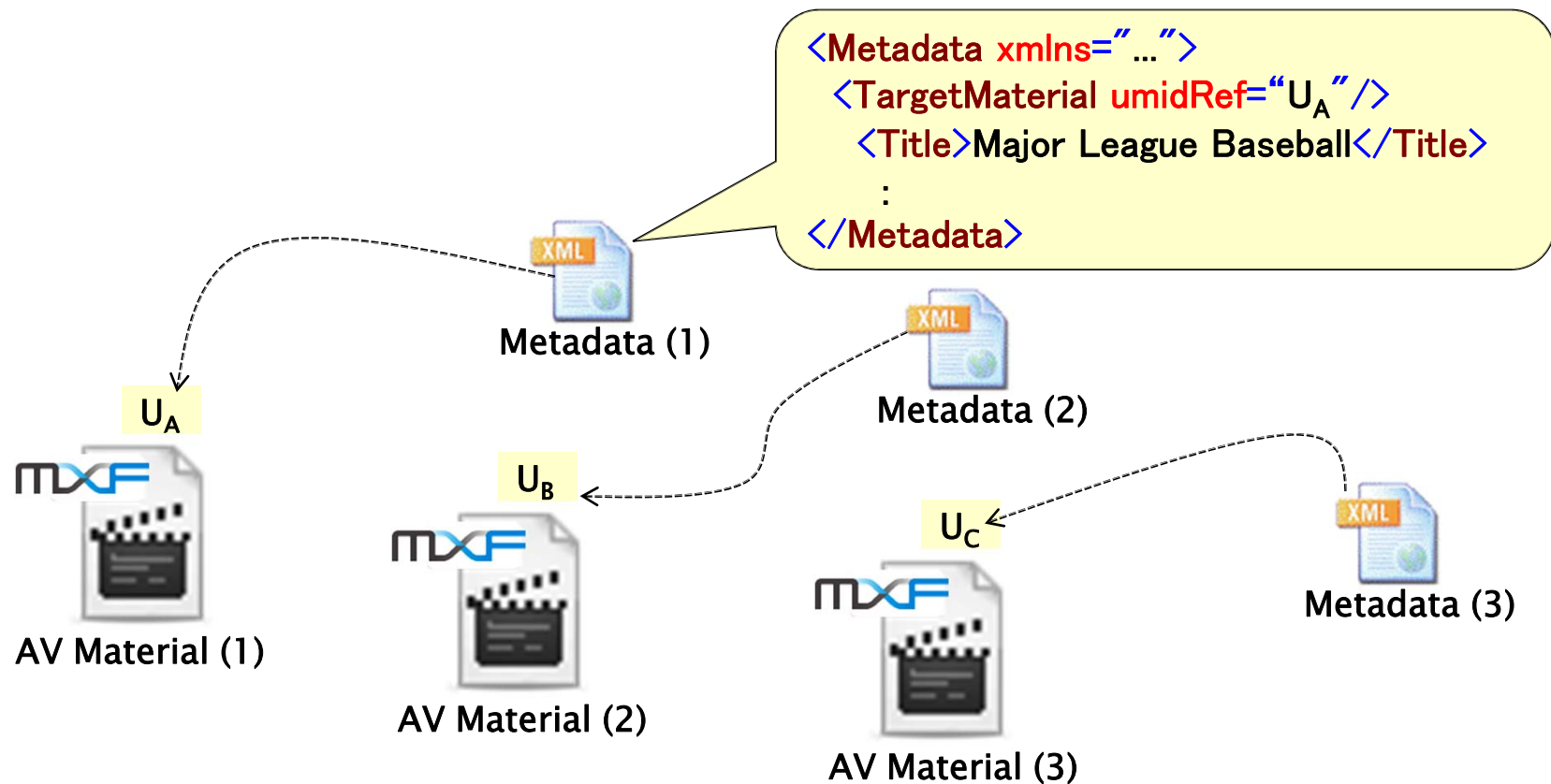
- ▶ As a unique identifier
 - New value for **Mat.#**
 - Zero for **Inst.#**
- ▶ As a linking tool
 - Shared value for **Mat.#**
 - Non-zero for **Inst.#**



These uses are mutually exclusive !

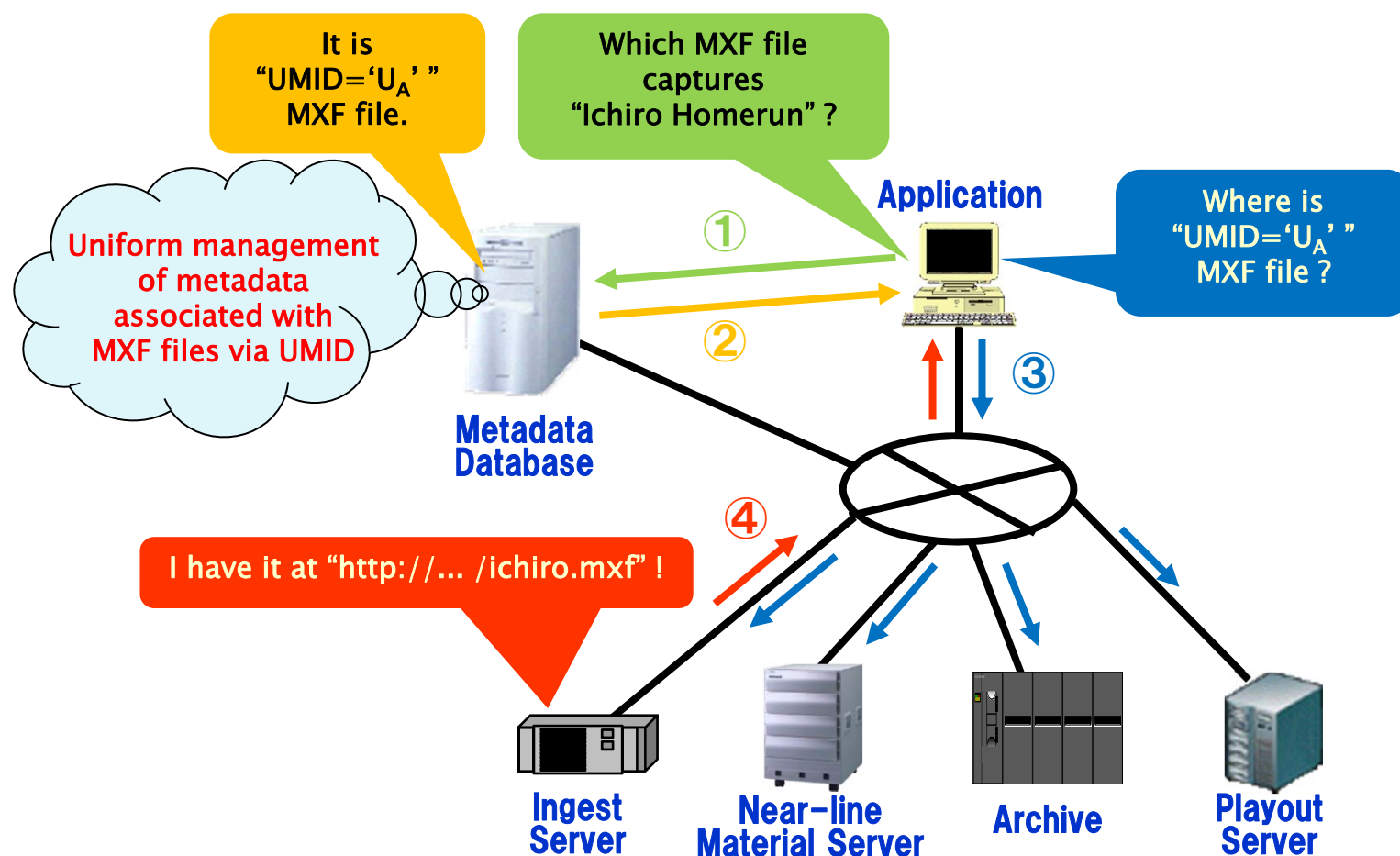
UMID as a Unique Identifier

- ▶ To associate an AV material with its metadata



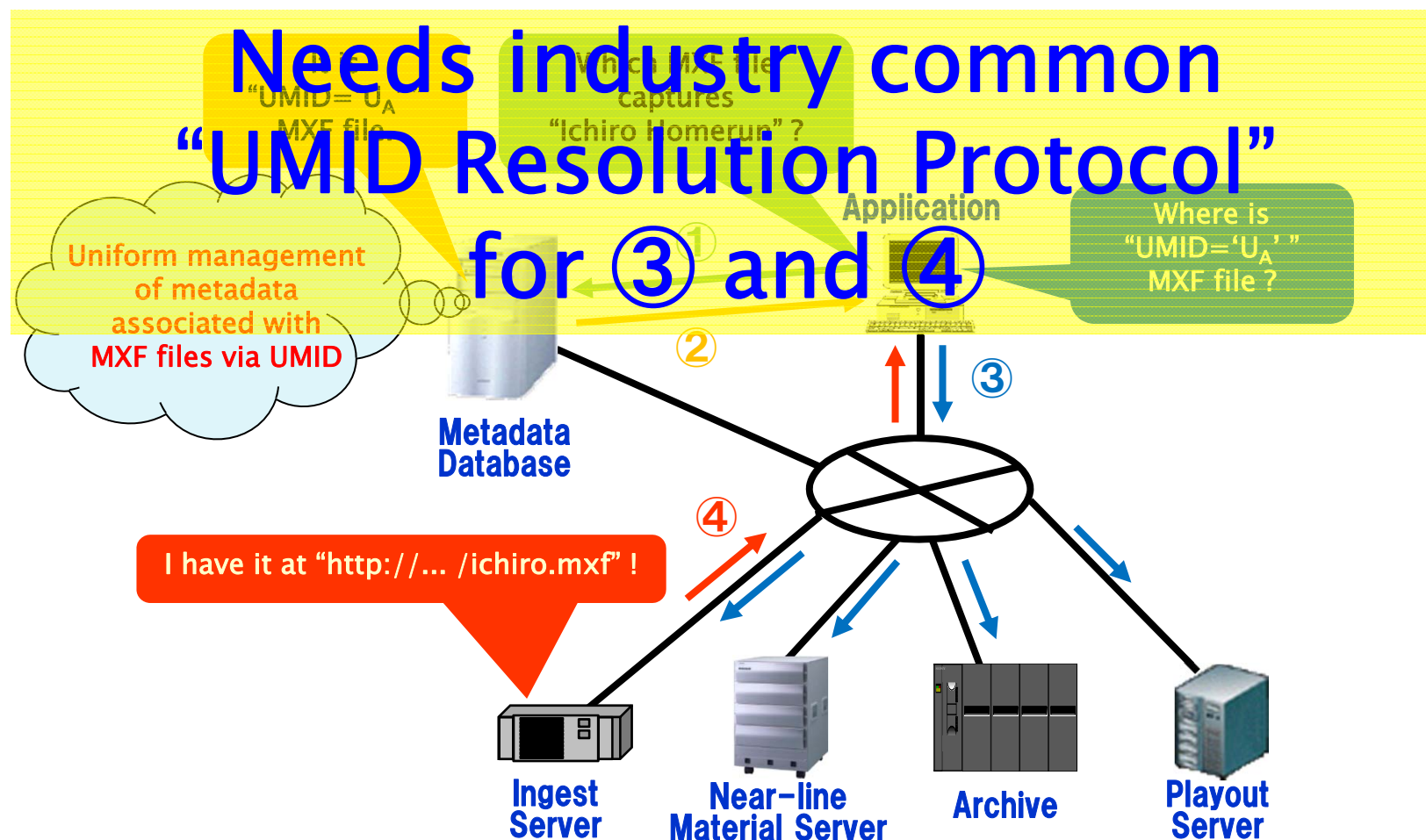
UMID based Material Search

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



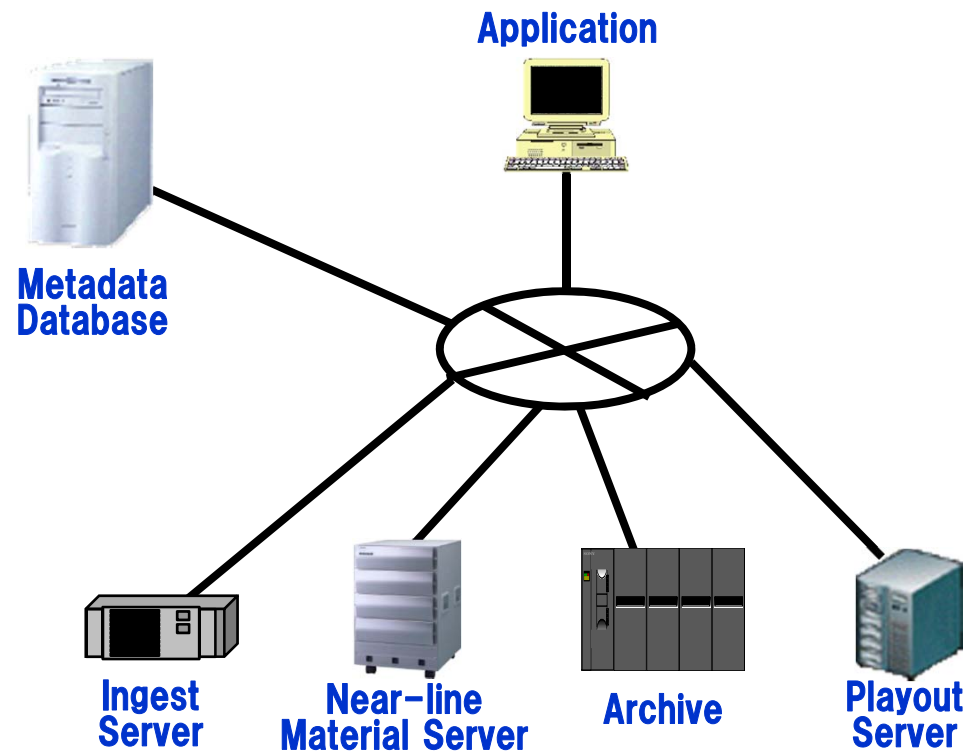
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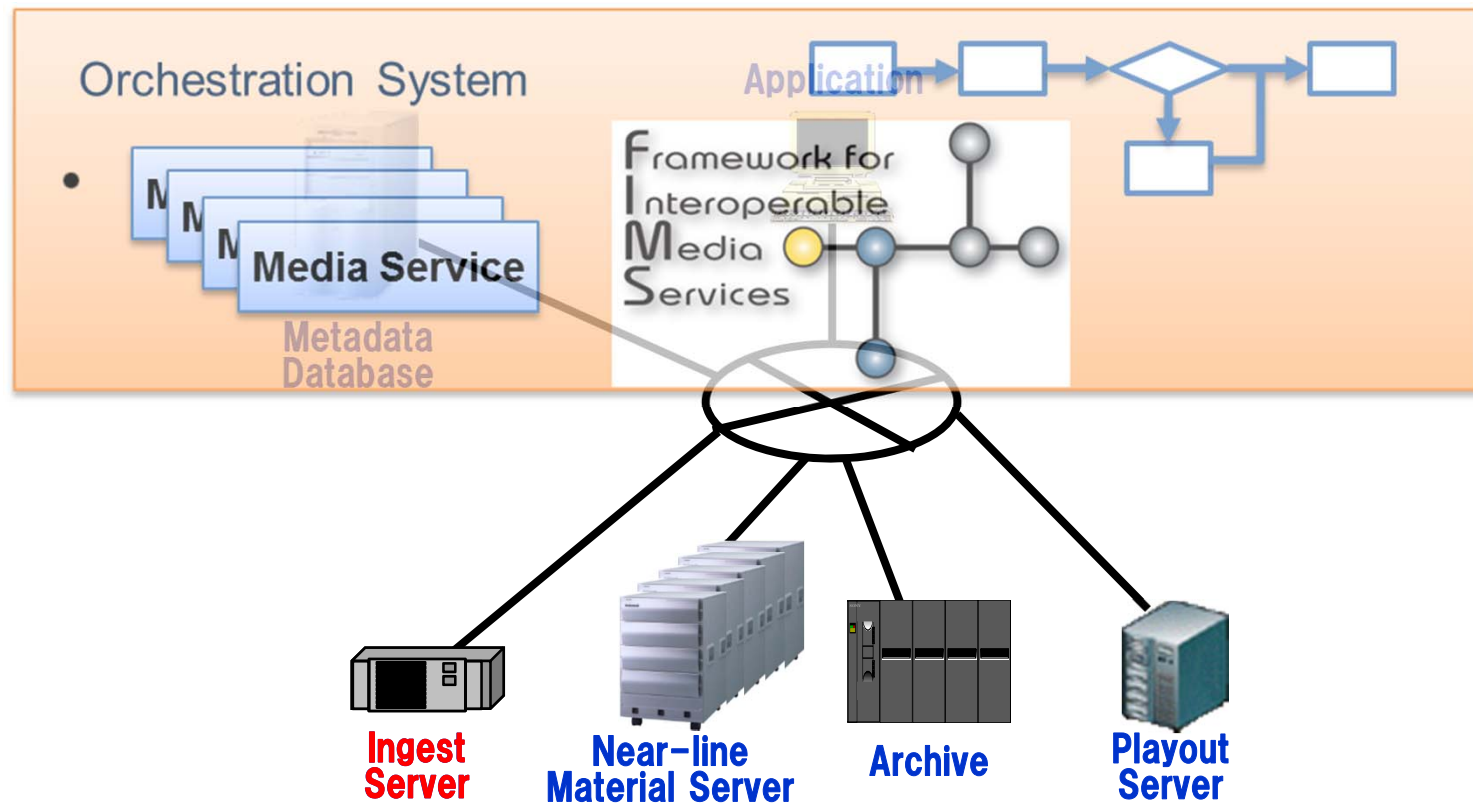
When Generalized

- ▶ Can be divided into two distinctive layers



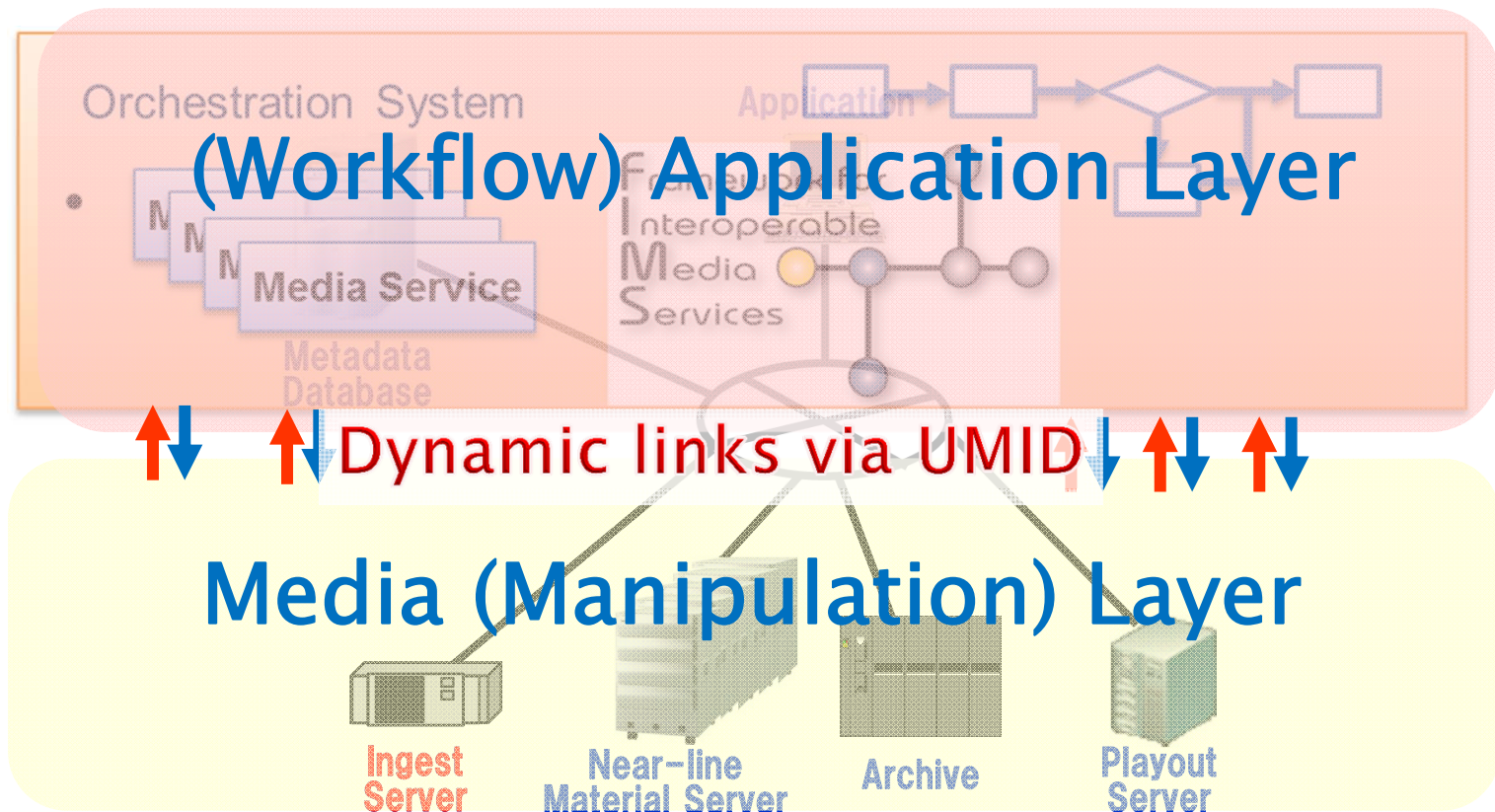
When Generalized

- ▶ Can be divided into two distinctive layers



When Generalized

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



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

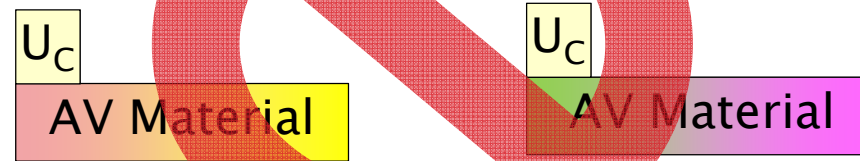
Outline

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What are They?

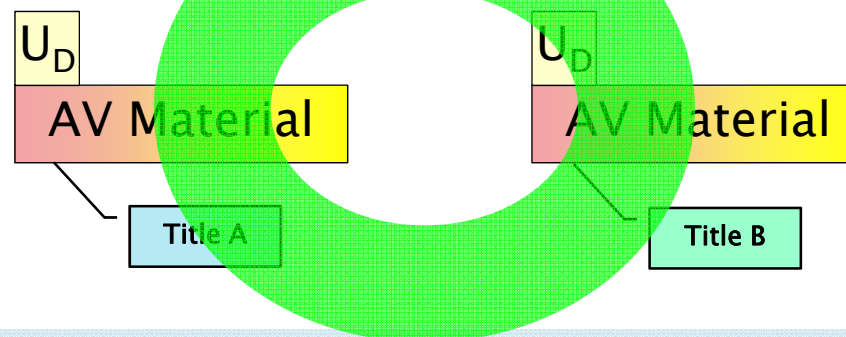
▶ Principle A: UMID Integrity

- Different AV materials **shall** be identified by different UMIDs



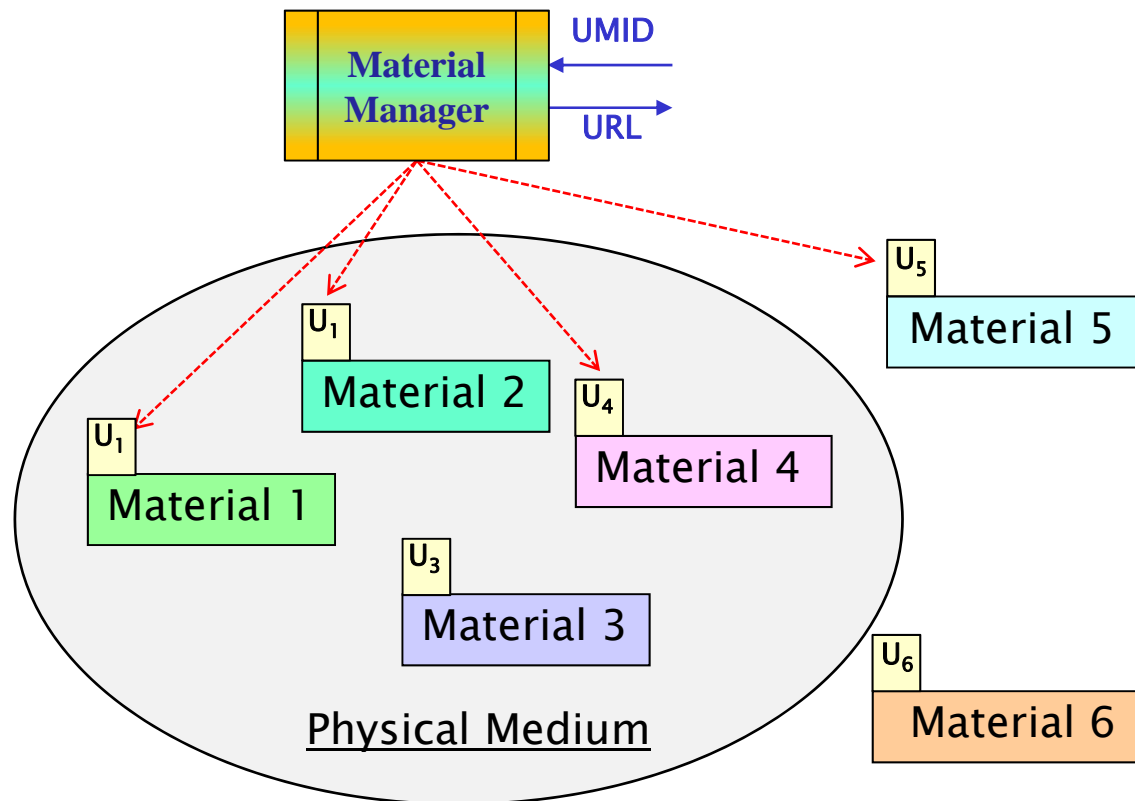
▶ Principle B: UMID Identification

- 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**

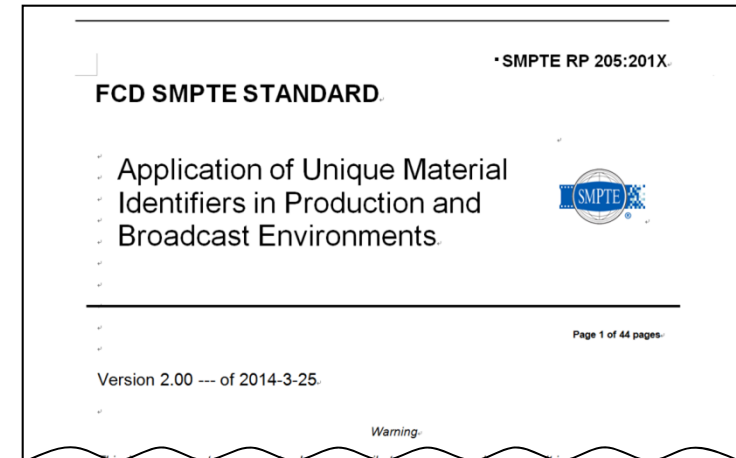
▶ Describes

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

▶ Status

- Under ST Audit

• **To be published shortly!**



Outline

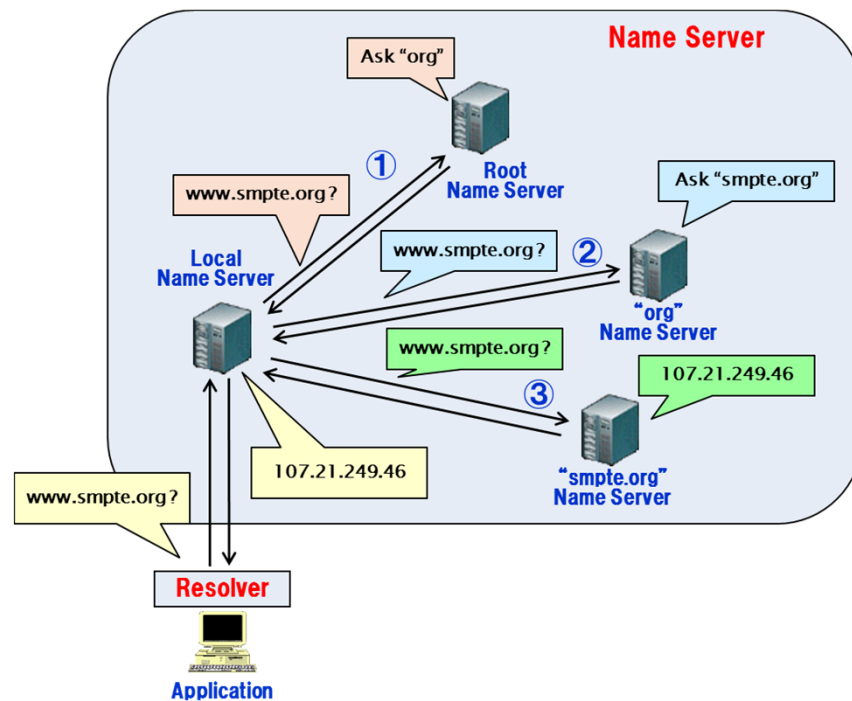
- ▶ What is the UMID?
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Requirements

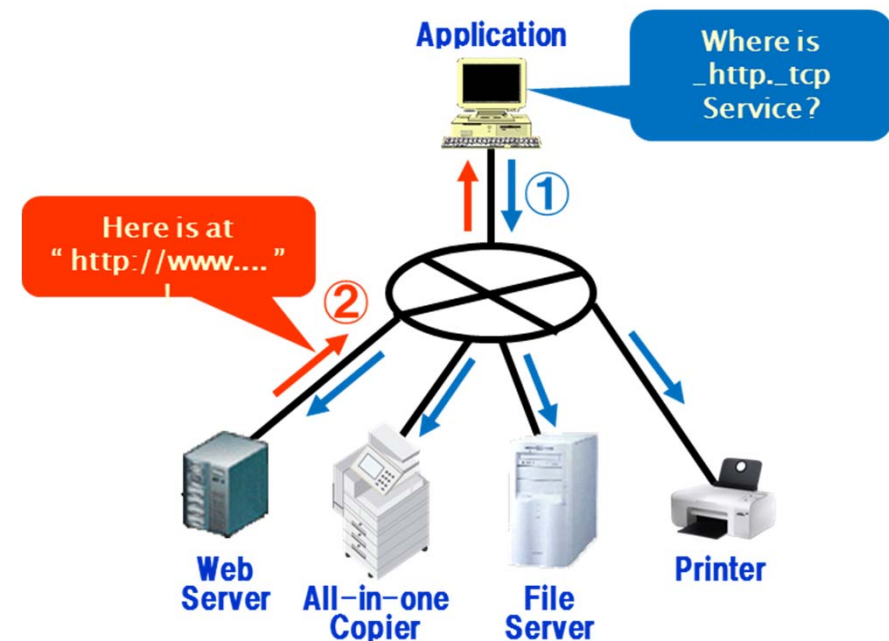
- ▶ Must provide a method for a given UMID to be converted to the URL of a material.
- ▶ Should provide basic technical information of a material together with the URL so that an application can judge its playability in advance.

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:\Windows\system32\cmd.exe
C:\>
C:\>nslookup -type=txt 0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdfd._umid._udp.local 127.0.0.1
Server:localhost
Address: 127.0.0.1
0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdfd._umid._udp.local text =
    "dur=60"
    "depth=10"
    "sample=422"
0d20.13000000.d2c9036c.8f195343.ab7014d2.d718bdfd._umid._udp.local text =
    "url=http://ingSrv.local/20130831/sports/file5.mxf"
    "codec=j2k"
    "wrapper=mxf"
local nameserver = ns1.local
ns1.local internet address = 127.0.0.1
C:\>
```

Domain-based UIMD Representation

Intrinsic Properties for Material (60sec, 10bit/pixel, YUV422)

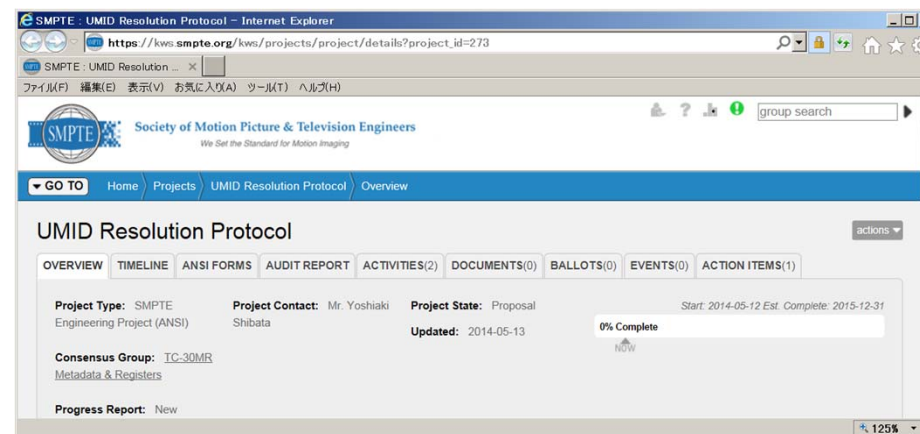
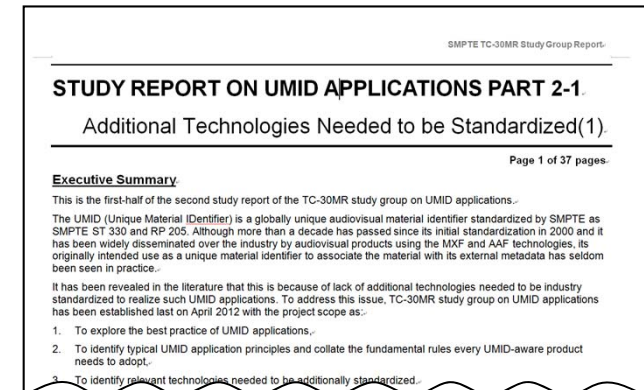
Media File Specific Properties (URL, JPEG2000, MXF)

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

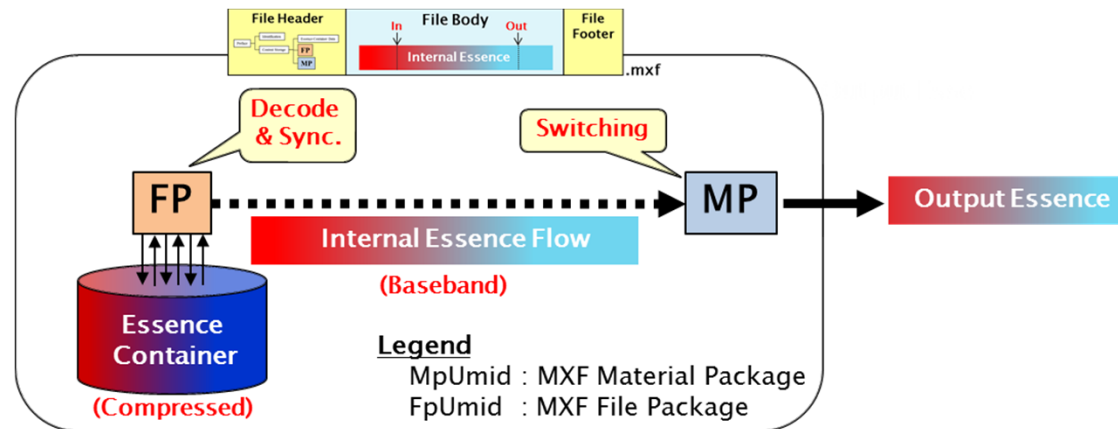


Outline

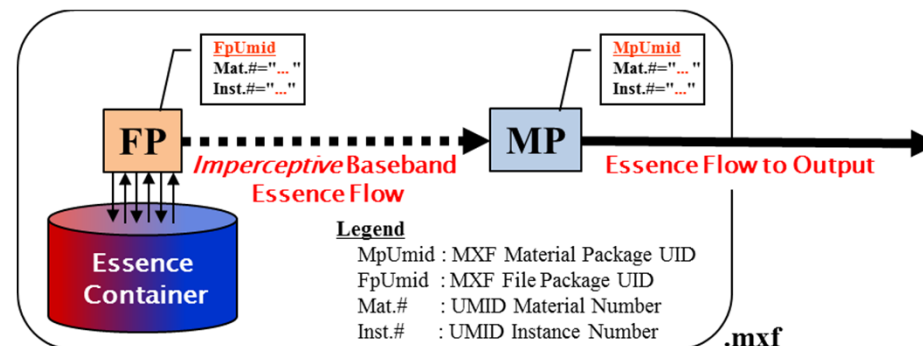
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MXF Internal Behavior Model

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

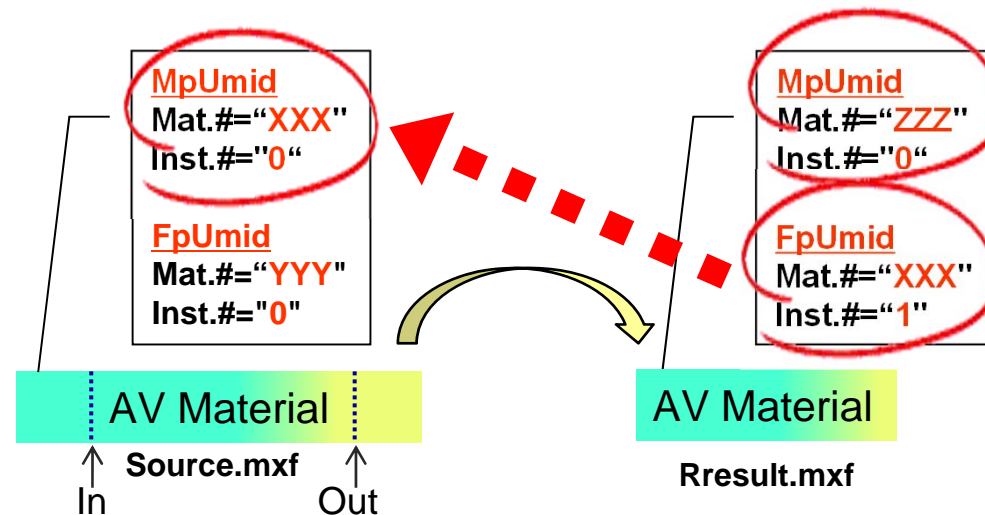


- ▶ UMID attached to FP and MP!



For Partial Retrieval

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

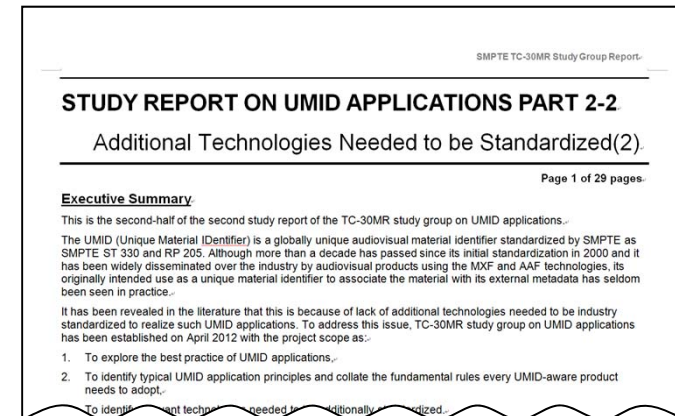


- ▶ Both “UMID as a unique identifier” and “UMID as a linking tool” are accommodated in MXF!

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>
- FAQs
 - http://metafrontier.jp/drupal/sites/default/files/info/AnnexD-fm-FCD_RP205_2014_3_25.pdf

▶ Study Report Part 2-1

- UMID Resolution Protocol
 - https://kws.smpte.org/kws/groups/30mr/documents/201403tbd5070/document?document_id=27420
- Draft Group
 - https://kws.smpte.org/kws/projects/project/details?project_id=273

▶ Study Report Part 2-2

- UMID Applications Specifically for MXF
 - https://kws.smpte.org/kws/groups/30mr-umid/documents/study4401/document?document_id=29356