# Interoperability and File-based production for HDTV

# How far away is 1080p/50,60 from mainstream production?

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# Overview

1. **Challenges due to HDTV**
2. **File based production: the interoperability questions**
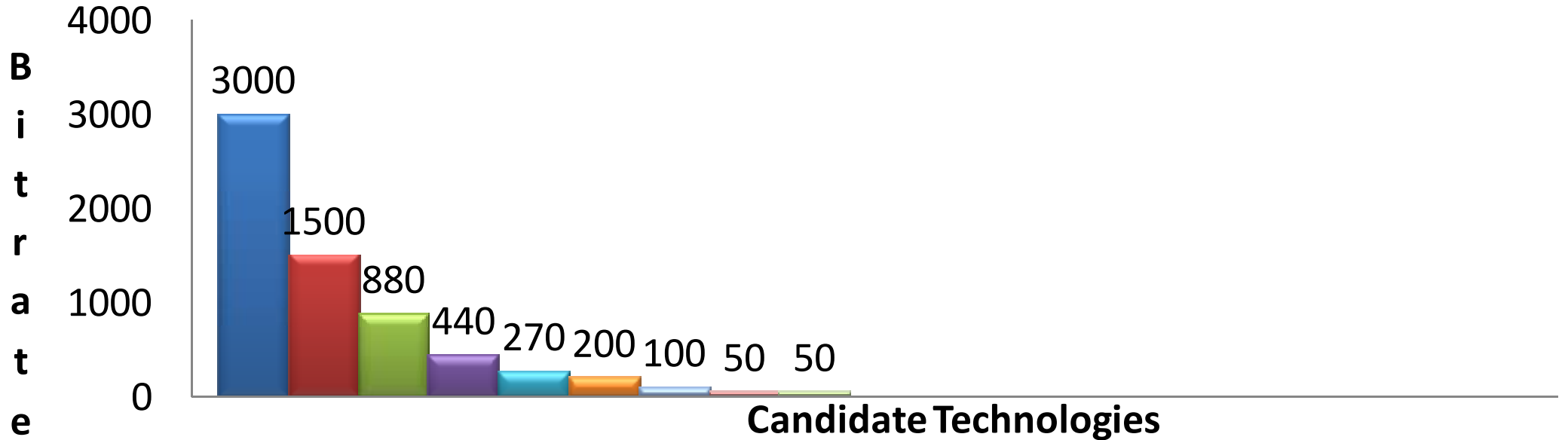3. **Status 1080p/50 in production**
4. **EBU activities**

# Why file based?

- Reduce costs
- Produce more programme for multiple platforms
- Flexible workflow adaptation to new businesses
- Avoid special designed solutions
- Collaboration location independent
- Utilize solutions from IT
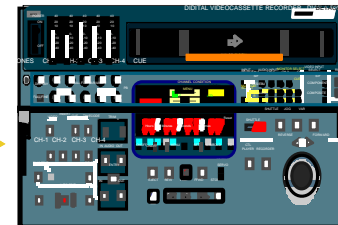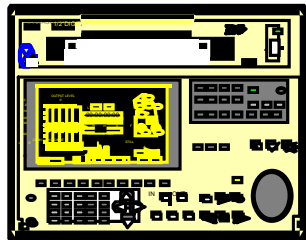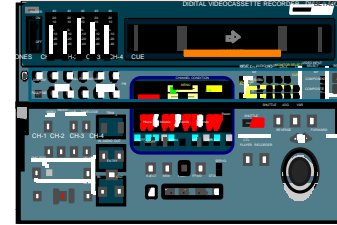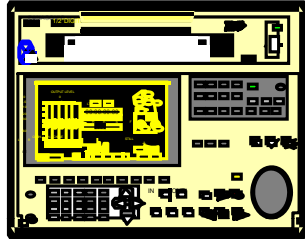
# Particular requirements for HD

# Review the interoperability questions

HD-SDI



Tape exchange

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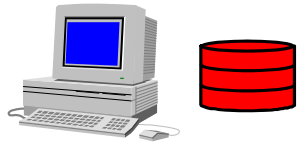
# Review the interoperability questions
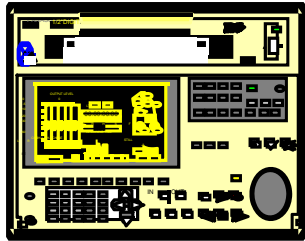
**SDTI**
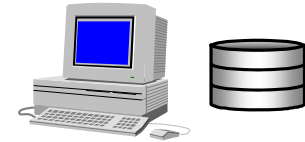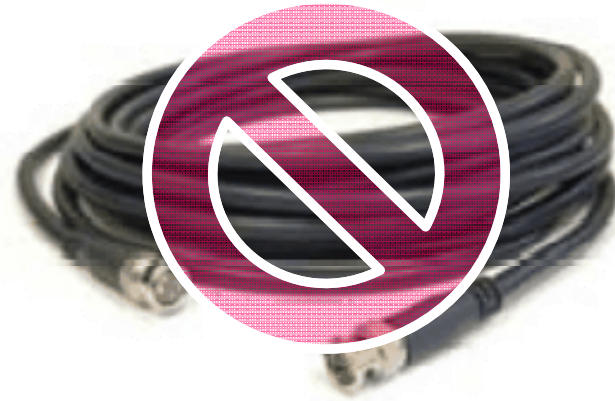


Physical and link layer compatible

But

Different compression formats

# Review the interoperability questions

Exchange Files
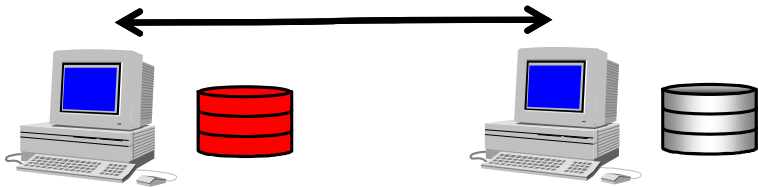
"FTP it to me"



➡ **Which File Format?**

**If MXF, which Operation Pattern?**

➡ **Which compression format?**

➡ **Which Metadata?**

➡ **Protocols, network, management?**

# The interoperability-performance questions

Exchange Files

"FTP it to me"
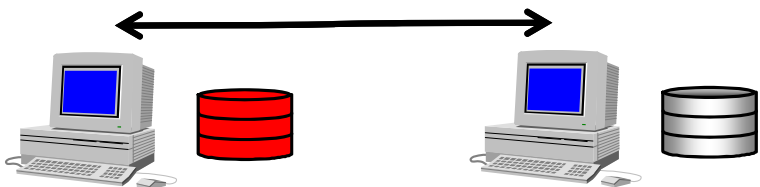
➡️ **How many real-time HD-SDI I/Os**

➡️ **Which *GUARANTEED* file transfer speed (faster than real-time) to how many clients?**

➡️ **Time for re-wrapping and transcoding?**

➡️ **What reliability and quality check?**

# Services/Processes Interoperability



Transcoder      Re-Wrapper      Ingest      Edit

Container, Wrapper, File Format
(Material Exchange Format - MXF, MPEG-...)

Metadata
Textual
Bin
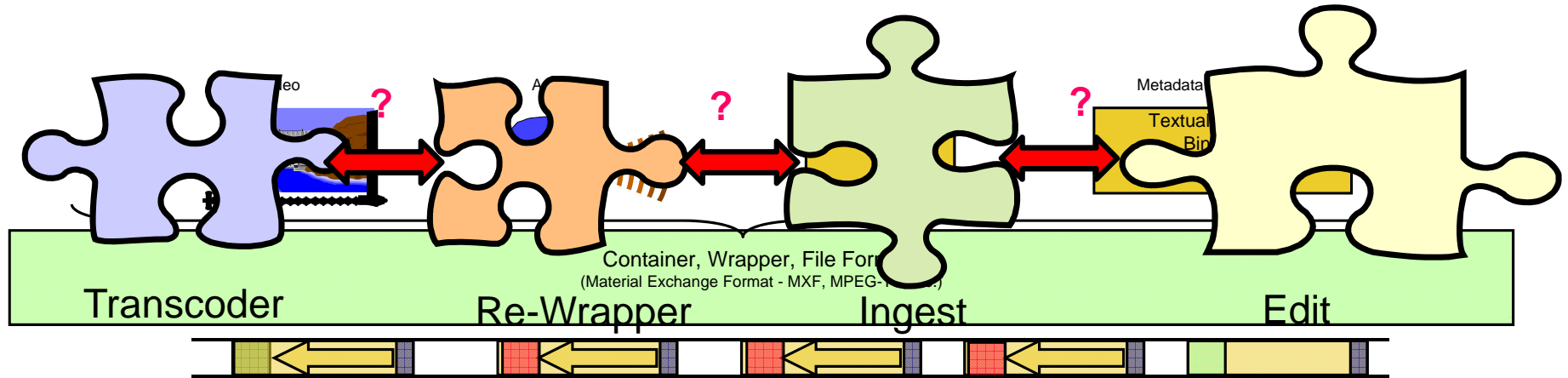
**plugging software components together**

mapping into the transports, adding identifiers, adding timing, QoS
(IP, TCP, UDP, RSVP, RTP, etc.)

*Fibre Channel, Gigabit Ethernet, 1394, ATM, SDH, etc.*

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# Services/Processes Interoperability



Transcoder  ?  Re-Wrapper  ?  Ingest  ?  Edit
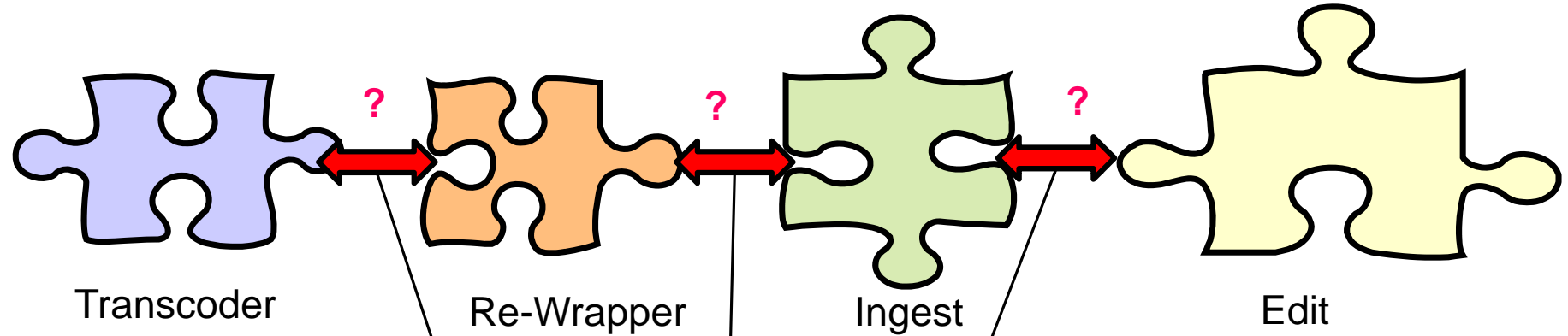
**EBU – AMWA FIMS**
**Framework for interoperable Media Services**

FIMS

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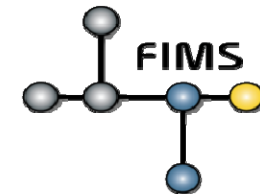
# How far away is 1080p/50 from mainstream?

**Let's review on what is there**

1. **Infrastructure:**

    uncompressed 3G SDI

    Router, switcher

2. **Cameras: High-End type cameras available, and consumer cameras**

3. **Studio compression:**

    HDCAM-SR (and light)

    AVC-Ultra

    JPEG

4. **Degree of overlap with 3D (2x 1080p/25, 2x 1080i/25, 2x720p/50) in terms of bitrates**

# How far away is 1080p/50 from mainstream?

**Let's review on what is missing**

**1. Mainstream cameras**

        Sensor technology?, 3G SDI level agreement, adequate pricing?

**2. Mainstream compression system**

        Codec with reasonable bandwidth requirements (storage, network load) at very good quality up to 7th generation

        Bit-streams standards for MXF

**3. Business case**

        Can one appreciate the quality difference?

        Can I created more value of content with 1080p/50?

        Distribution to the home (STB) an option?

        Co-existing business model with 3D?

# Some side thoughts.......looking at the industry

**Wouldn't it be nice, if........**

- **Drive for an agile decoder**

  - Understands the MPEG family

  - Can do 1080p/50

- **Define a HD master format**

  - that limits to one common TV production image format (1080p/50)

- **Common Metadata solution at the acquisition point**

# EBU Strategic Programme: SP-HIPS

## Harmonisation and Interoperability of HDTV Production Standards

**MXF Interoperability**
**TC, Subtitles, Constraint(?)**
(chaired by IRT, C. Nufer)

**New studio codec tests**
Testplan, Test Content,
Codec test (6 month)
(chaired by RAI, M. Visca)

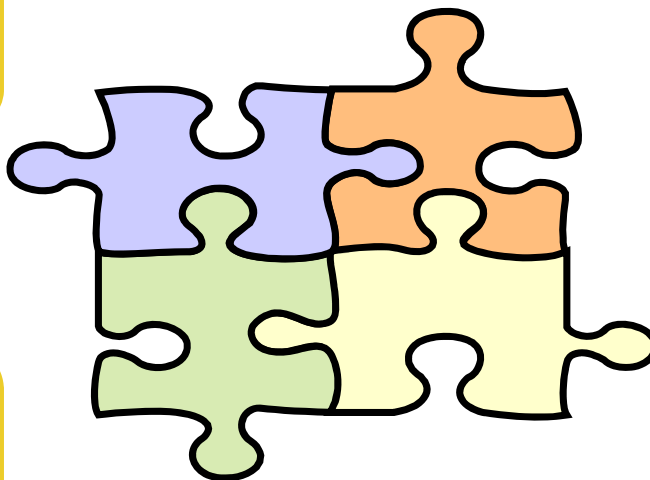**Acquisition Metadata**
**Tech. Metadata, Descriptive**
(chaired by RAI, D. Airola)

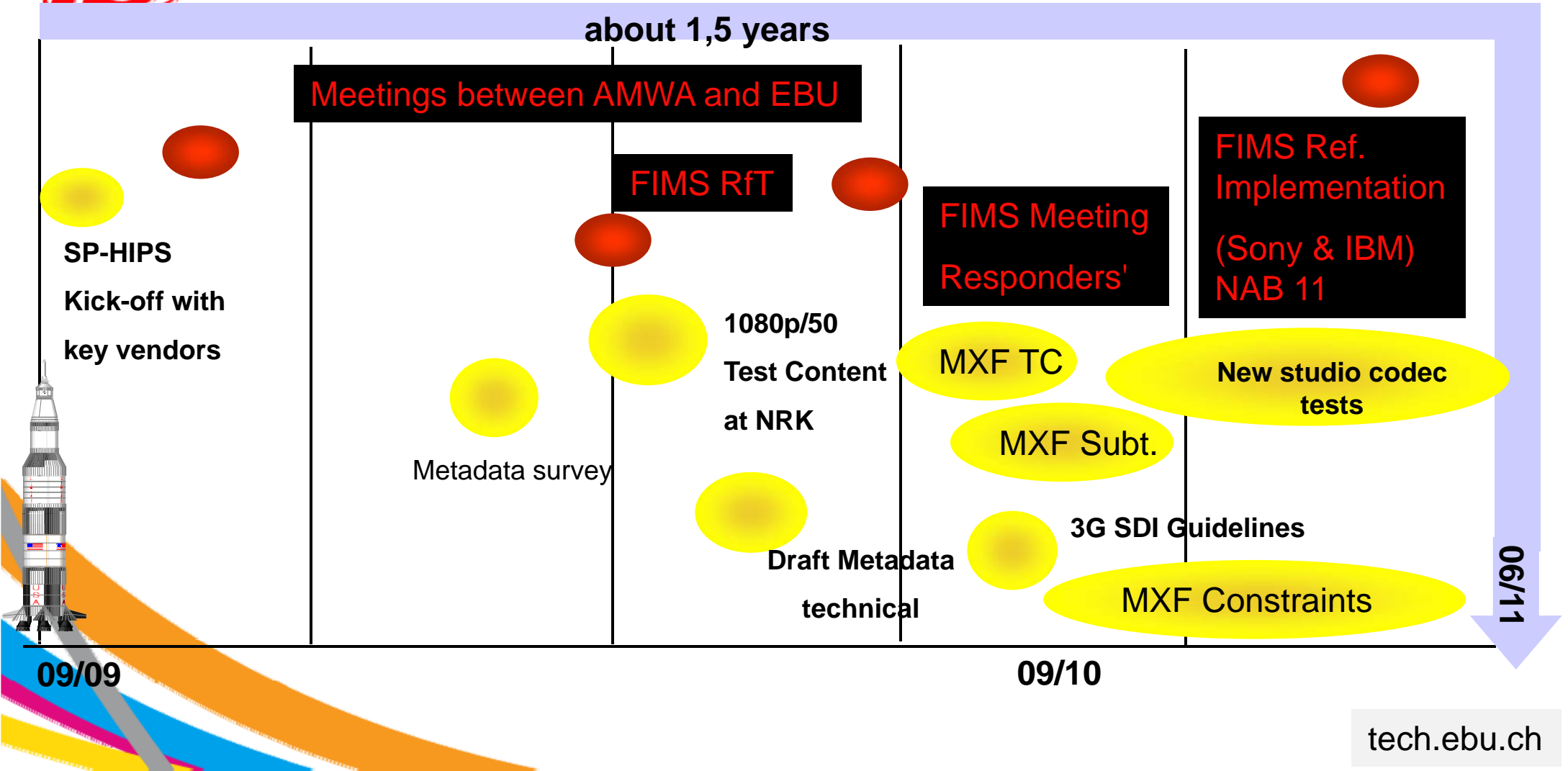**Best Practise on 3G SDI**
**Draft Best Practise**
(chaired by BBC, A. Quested)

**Strong Industry Commitment**

**(Sony, GV, Panasonic, Snell, Avid)**

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# Rough outline of action and deliverables

about 1,5 years

Meetings between AMWA and EBU

FIMS RfT

FIMS Meeting Responders'

FIMS Ref. Implementation (Sony & IBM) NAB 11

SP-HIPS Kick-off with key vendors

1080p/50 Test Content at NRK

MXF TC

New studio codec tests

Metadata survey

MXF Subt.

Draft Metadata technical

3G SDI Guidelines

MXF Constraints

09/09

09/10

06/11

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# What to take away

1. **Current situation in file based HD production <span style="color:red">is a mess</span> but the work between EBU, industries, associations and standards bodies is providing good direction**

2. **This cooperation's, in an aggressive time schedule have already provided success points**

3. **1080p/50 in production is part of many vendors strategies, but not yet mainstream (cost),**

   ......it will have impact to mainstream in the next 2-4 years (3D implications)

4. **Join the work if you want to be part of the developments**

**For more information:**

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