MPEG- 4 Based Codec Overview
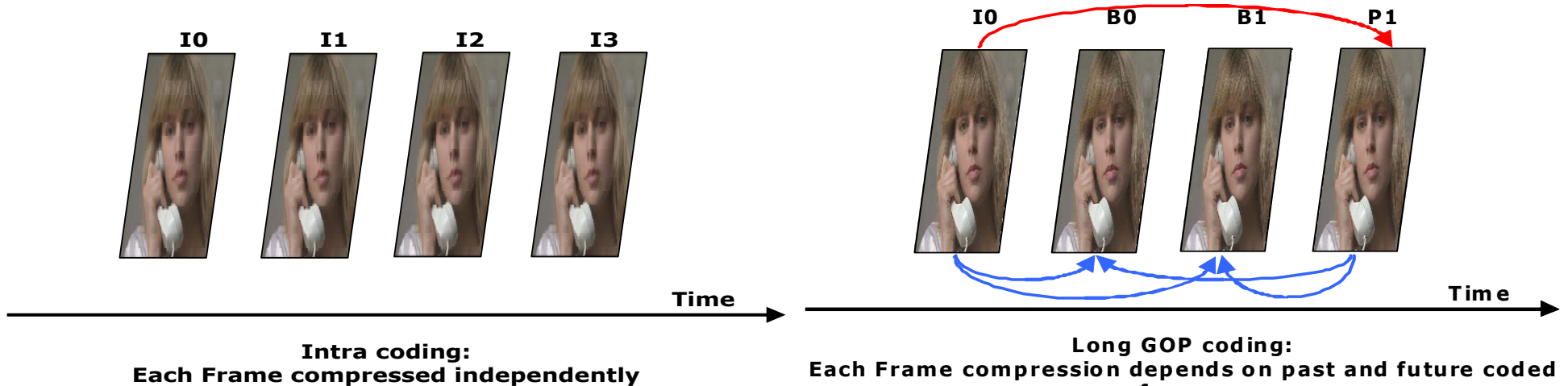
Sylvain Rivière

EVP Marketing – ATEME

MPEG-4 aka AVC/H.264 Broadcast Profiles
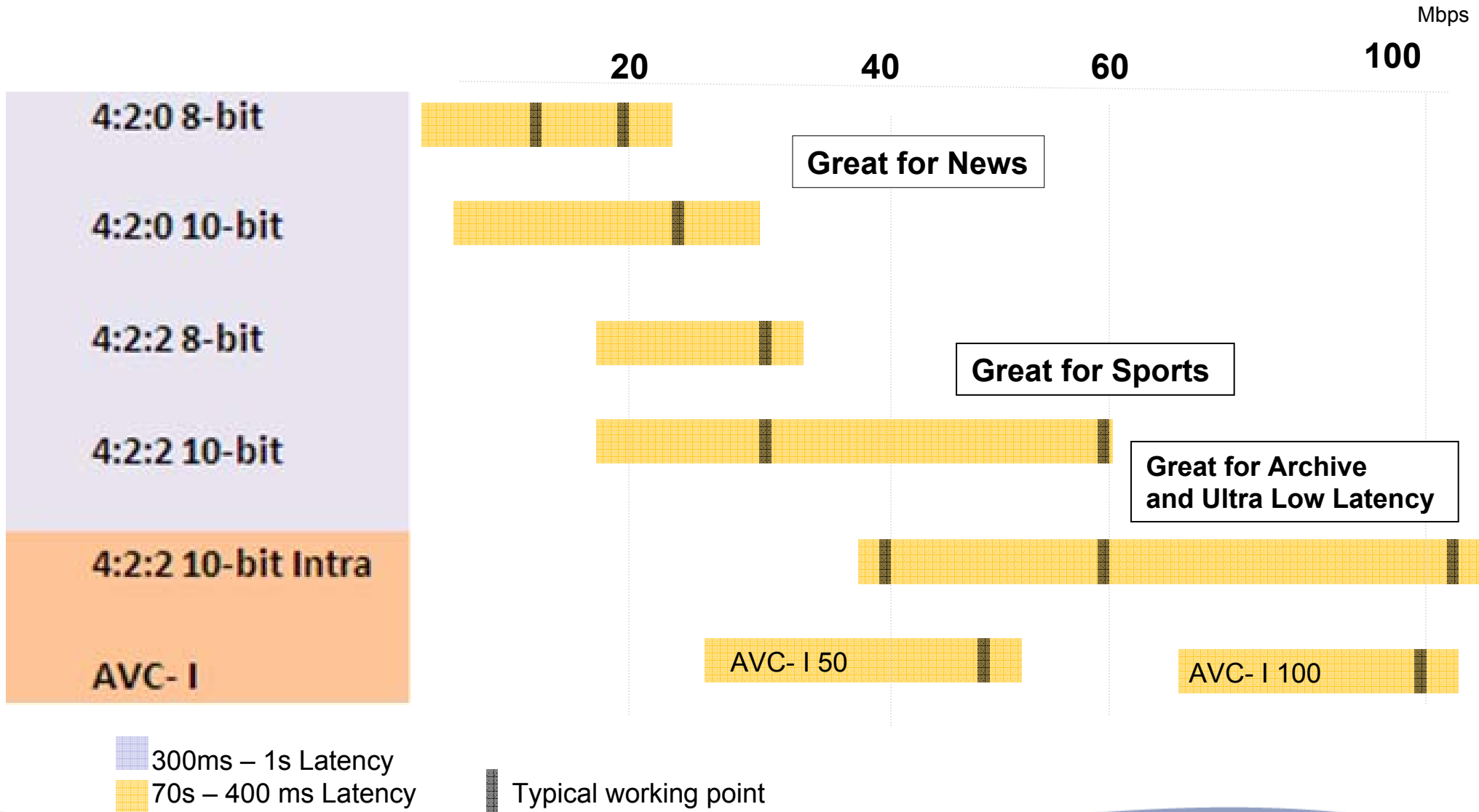
Coding Tools	Main Profile	High Profile	High 4:2:2 Profile
I,P,B slices	X	X	X
Multiple Reference Pictures	X	X	X
CAVLC, CABAC Entropy Coding	X	X	X
Interlaced Coding	X	X	X
Weighted Prediction	X	X	X
In-loop Filtering	X	X	X
4:2:0 Chroma Format	X	X	X
8-bit Sample Depth	X	X	X
8x8 Transform		X	X
8x8 Intra Prediction		X	X
Quantization Scaling Matrices		X	X
Separate Chroma Quantizers		X	X
Monochrome Video Format		X	X
9 and 10-bit Sample Depth			X
4:2:2 Chroma Format			X

Intra frame only Profile

I0 I1 I2 I3

Time

Intra coding:
Each Frame compressed independently

I0 B0 B1 P1

Time

Long GOP coding:
Each Frame compression depends on past and future coded
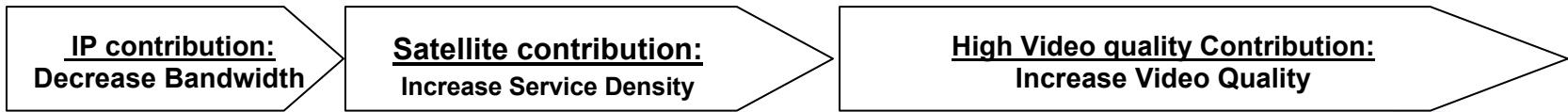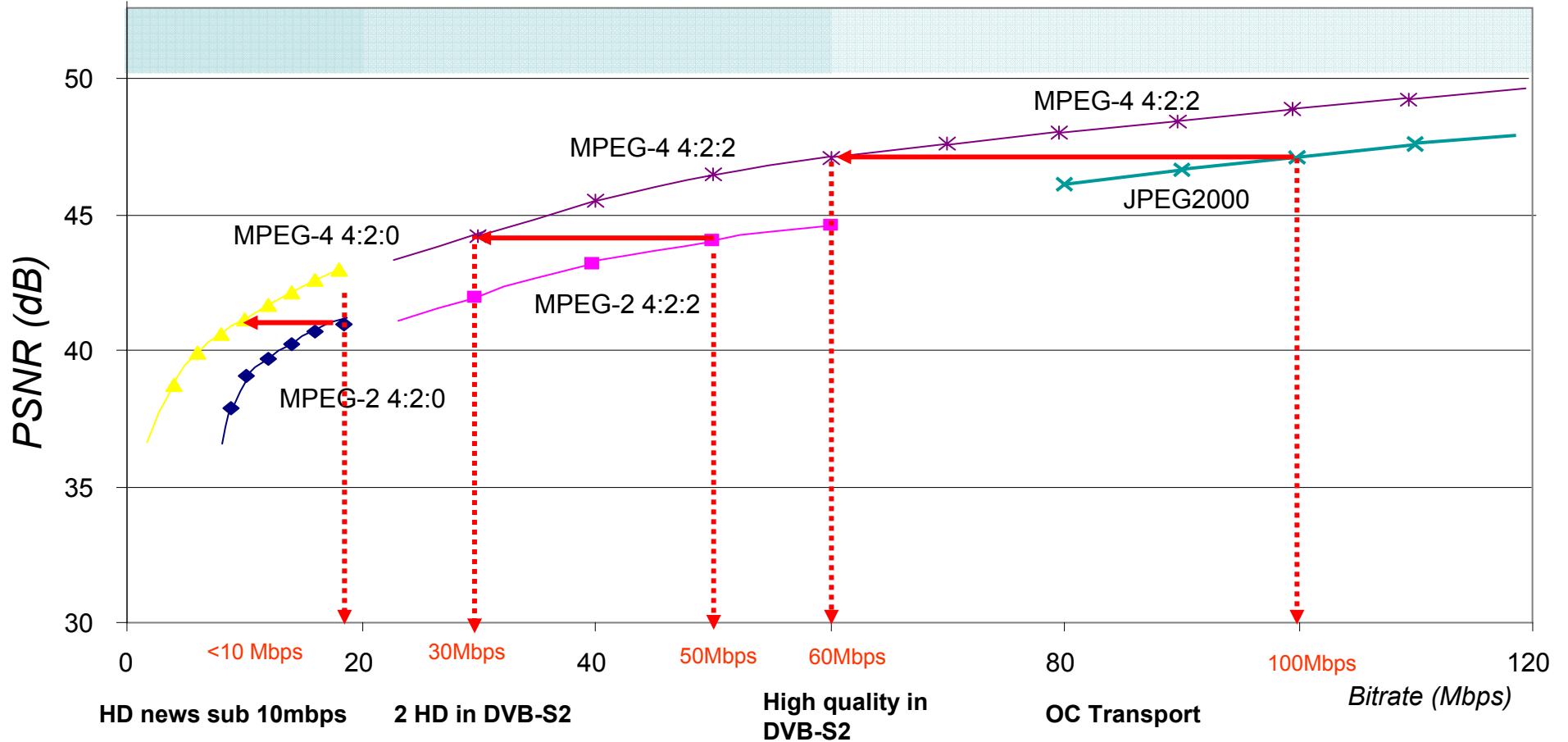
- Benefits Lower Latency and Non Linear Editing capable Stream

- Price to pay is double bandwidth over long GOP

- High422 and Panasonic AVC-I use Intra only scheme

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MPEG-4 Based Profile Bit Rate Range

Mbps
20   40   60   100

4:2:0 8-bit

4:2:0 10-bit

4:2:2 8-bit

4:2:2 10-bit

4:2:2 10-bit Intra

AVC-I   AVC-I 50   AVC-I 100

Great for News

Great for Sports

Great for Archive and Ultra Low Latency

300ms – 1s Latency
70s – 400 ms Latency   Typical working point

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Internal

Comparison of Legacy Contribution Codecs

MPEG-4 based Codec Summary for contribution

- MPEG-4 Codec Long GOP Serves Bandwidth Efficiency and Interoperability
  - However higher CAPEX over MPEG-2 and JPEG-2K today
  - Latencies below 300 ms compromise quality and interoperability

- Panasonic AVC- I & High 422 Intra address Ultra low latency , file editing & archiving yet….
  - AVC-I 50 is low quality and AVC-I 100 quality comparable to JPEG2K at identical bit rate
  - JPEG2K pair widely available makes it favorite choice over AVC-I
  - Efficient High 422 Intra could emerge as alternative to JPEG2K in future

MPEG-4 Contribution Summary Trends Today

- MPEG4 is replacing MPEG-2 where bandwidth (SAT) and video quality (HD) sensitive

- MPEG4 is providing JPEG2K quality over Satellite Networks

- JPEG2K address cost, low Latency when bandwidth is available and is also standardized around editing

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ATEME Solution focus

- ## Turn Key H.264 Video Head End
  - IPTV / Distribution /Terrestrial

- ## Multi Screen Transcode
  - High Quality VOD / Archiving

- ## MPEG-4 Contribution
  - Fixed and Truck

Universal Contribution Pair

CM4101 - Encoder

DR8400 – Decoder

High 4:2:2 Intra

High 4:2:2 10-bit

4:2:2 8-bit

4:2:0 10-bit
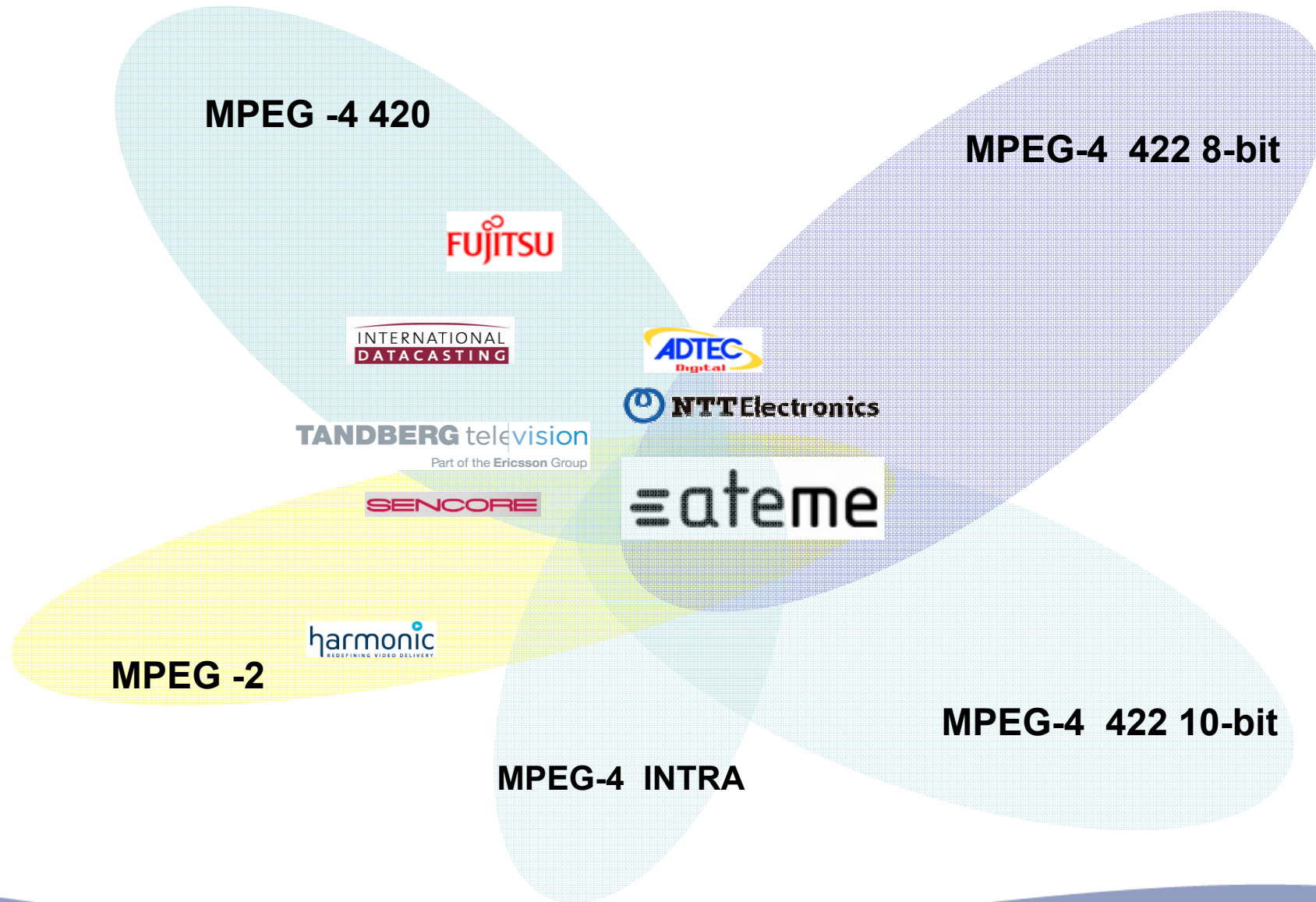
4:2:0 8-bit

MPEG-2
4:2:0 / 4:2:2

... With Third Party Interoperability In Mind

THANK YOU

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