

# The power of H.264

Sep, 2006

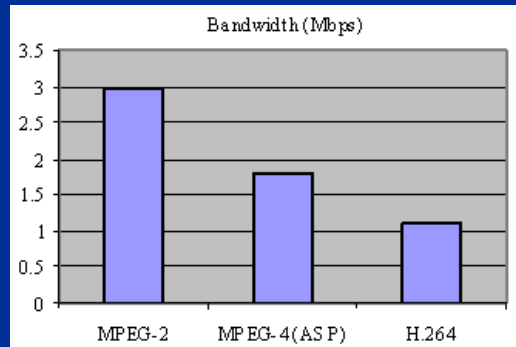
## The power of H.264

- H.264 is one of the most efficient video compression technology by now.
- Generally, users will experience following benefits:
  - Up to 40 % higher image quality
  - Over 60 % of saving on recording storage space
  - Truly "Live" performance over various of network transmission condition

## Benefit – Efficiency

- 2x more efficient than MPEG-4 Part 2 (natural video) encoding:

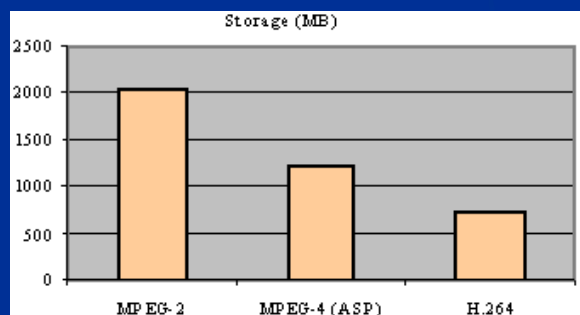
H.264 offers dramatically lower bit rates and better picture quality than MPEG-2, MPEG-4, H.263+ etc.



## Benefit – File Size

- 3x smaller file size than comparable MPEG-2 encoders

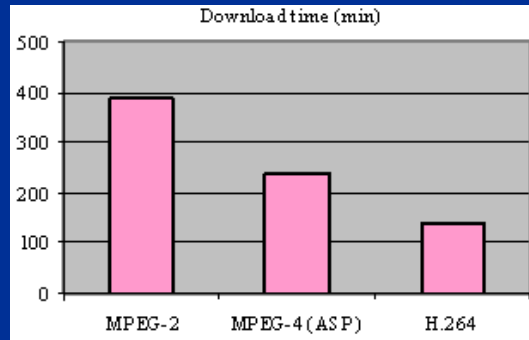
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## Benefit – Download Time

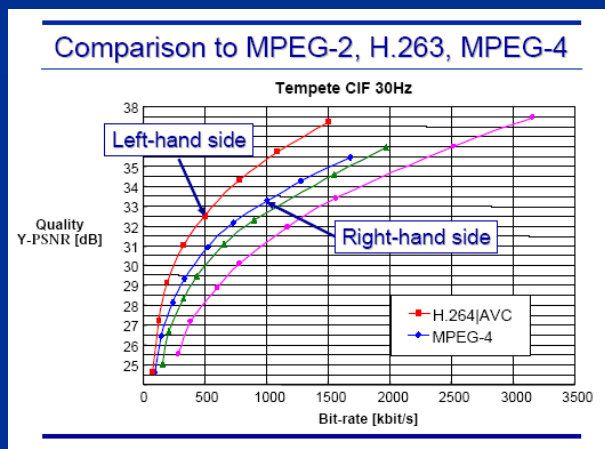
### ■ Faster download time

H.264 offers dramatically lower bit rates and better picture quality than MPEG-2, MPEG-4, H.263+ etc.



## Benefit – Higher quality

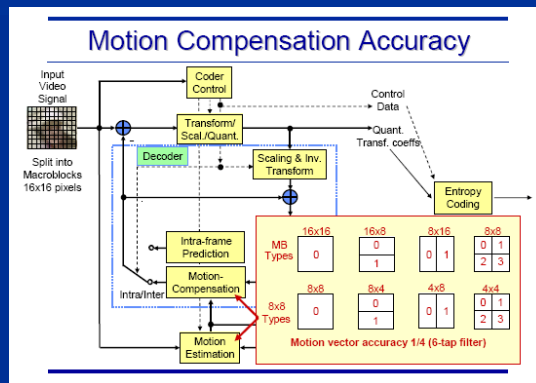
### ■ Substantially higher quality video (SNR)



H.264 offers dramatically lower bit rates and better picture quality than MPEG-2, MPEG-4, H.263+ etc.

## Benefit – No Motion Blurring

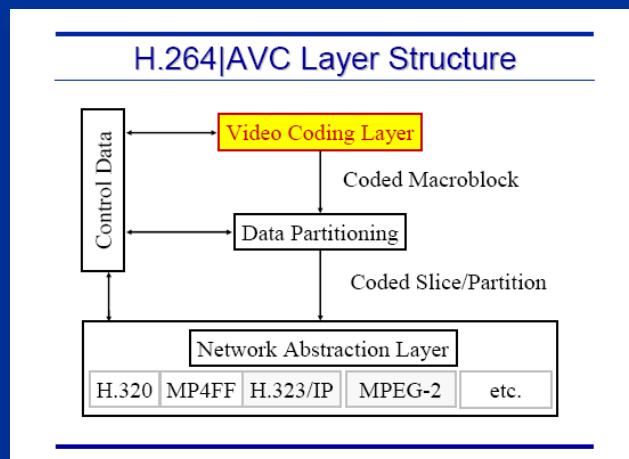
- No fast motion blurring inherent in MPEG-4 (advanced motion compensation)



H.264 offers dramatically lower bit rates and better picture quality than MPEG-2, MPEG-4, H.263+ etc.

## Benefit – Capability

- Anticipates error-prone transport over mobile networks



## Benefit – Capability

### ■ Anticipates error-prone transport over mobile networks

Many standards contain different configurations of capabilities – often based in “profiles” & “levels”

- A profile is usually a set of algorithmic features
- A level is usually a degree of capability (e.g. resolution or speed of decoding)

H.264/AVC has three profiles

- Baseline (lower capability plus error resilience, e.g., videoconferencing, mobile video)
- Main (high compression quality, e.g., broadcast)
- Extended (added features for efficient streaming)

Profiles & Levels Concepts Profiles & Levels Concepts

## Benefit – Capability

### ■ Anticipates error-prone transport over mobile networks

Video coding layer is based on hybrid video coding and similar in spirit to other standards but with important differences

Some new key aspects are:

- Enhanced motion compensation
- Small blocks for transform coding
- Improved de-blocking filter
- Enhanced entropy coding
- Substantial bit-rate savings relative to other standards for the same quality

# H.264 Encoding Feature Evolution

- The following table compares H.264 with both MPEG-2 and MPEG-4 feature sets.

		Standards		
		MPEG-2	MPEG4	Aventura H.264
Features	I, P, B-frames	✓	✓	✓
	Interlace	✓	✓	✓
	Coding	Huffman	Huffman	Huffman or Arithmetic
	Block size	fixed 16x16	fixed 16x16	variable down to 4x4
	¼ pixel		✓	✓
	GMC		✓	
	Loop Filter (aka deblocking filter)			✓
	Slice-based motion prediction			✓
	Multiple reference frames			✓
	MB AFF (improved interlaced management)			✓
	RDO (Rate Distortion Optimisation)			✓
	WP (Weighted Prediction)			✓
	Switching pictures (for fast change channel)			✓