

free

▶ **Next Generation Intelligent Video
Acquisition Solution for IPTV**

Christophe Massiot
Television Head-End Manager
Free

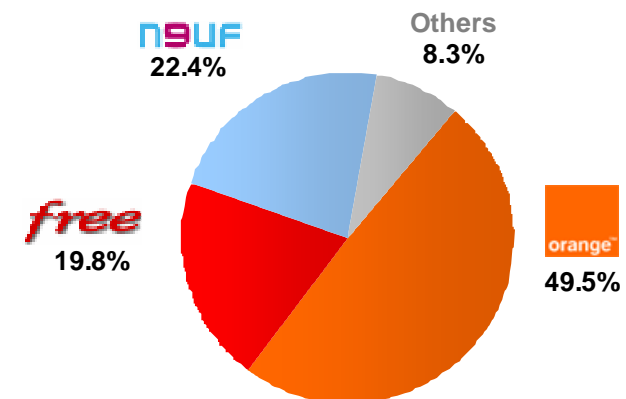
About Free...

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- **A subsidiary of the Iliad Group**
(Euronext Paris:ILD)
- **The 1st Triple Play Set-Top Box**
- **Call attention to technological innovation and expansion of its DSL offer at constant prices**
- **2.767.000 subscribers**
(September, 2007)



Sep. 30, 2007
Market Shares

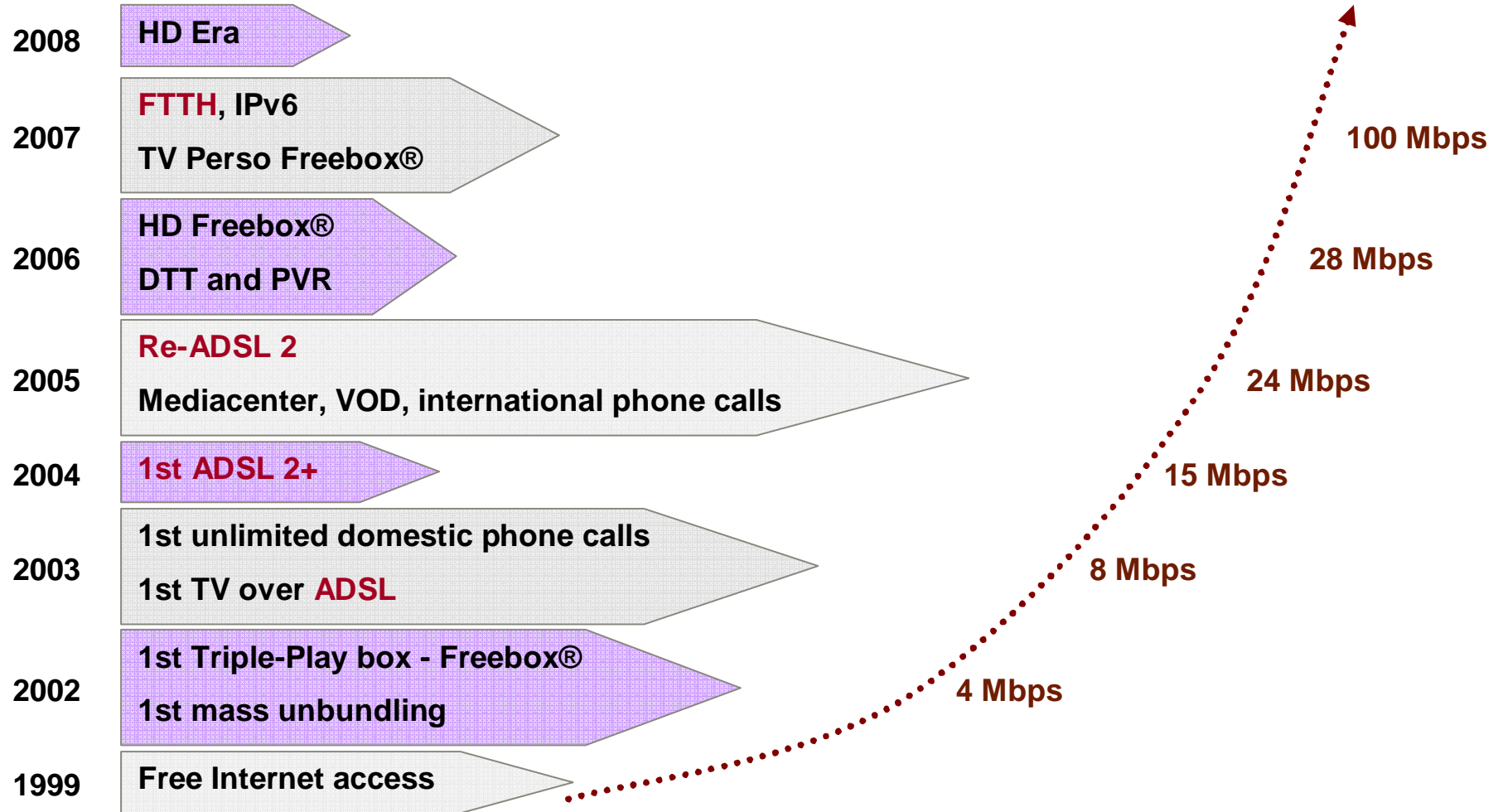


Source: ARCEP and France Telecom



About Free...

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Broadcast existing offer

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- **250 TV channels and radios**
 - 100 channels in basic package
 - Partly available on PC
 - Freebox HD provided freely with PVR features
 - *Canalsat* and *Canal+ Le Bouquet* options



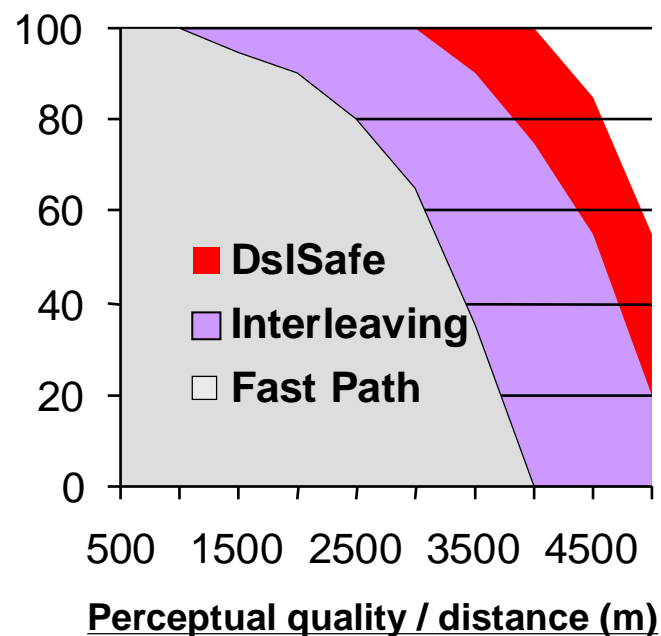
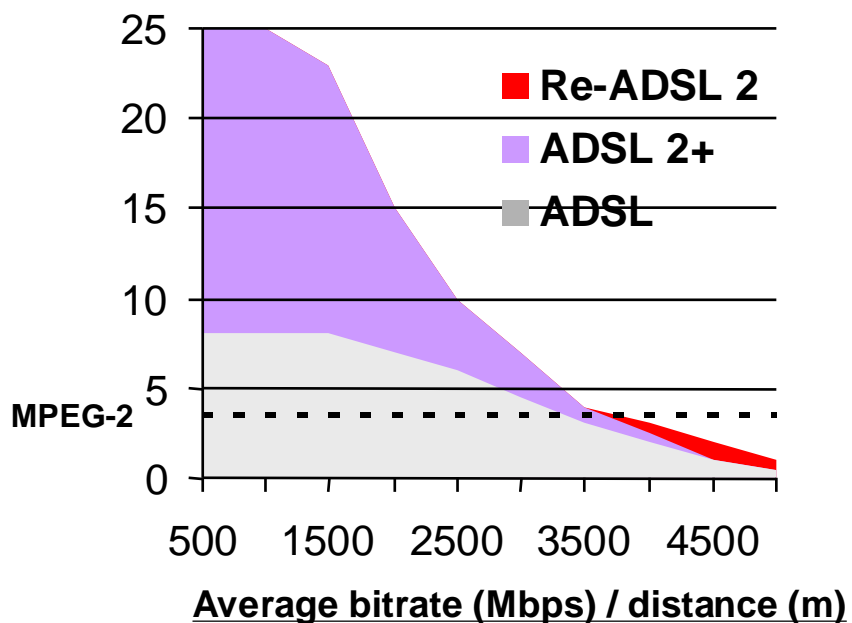
CANALSAT

- **More than 1 M subscribers eligible to HD service**
- **TV Perso Freebox®: Self-produced videos**



Bitrate and QoE on ADSL lines

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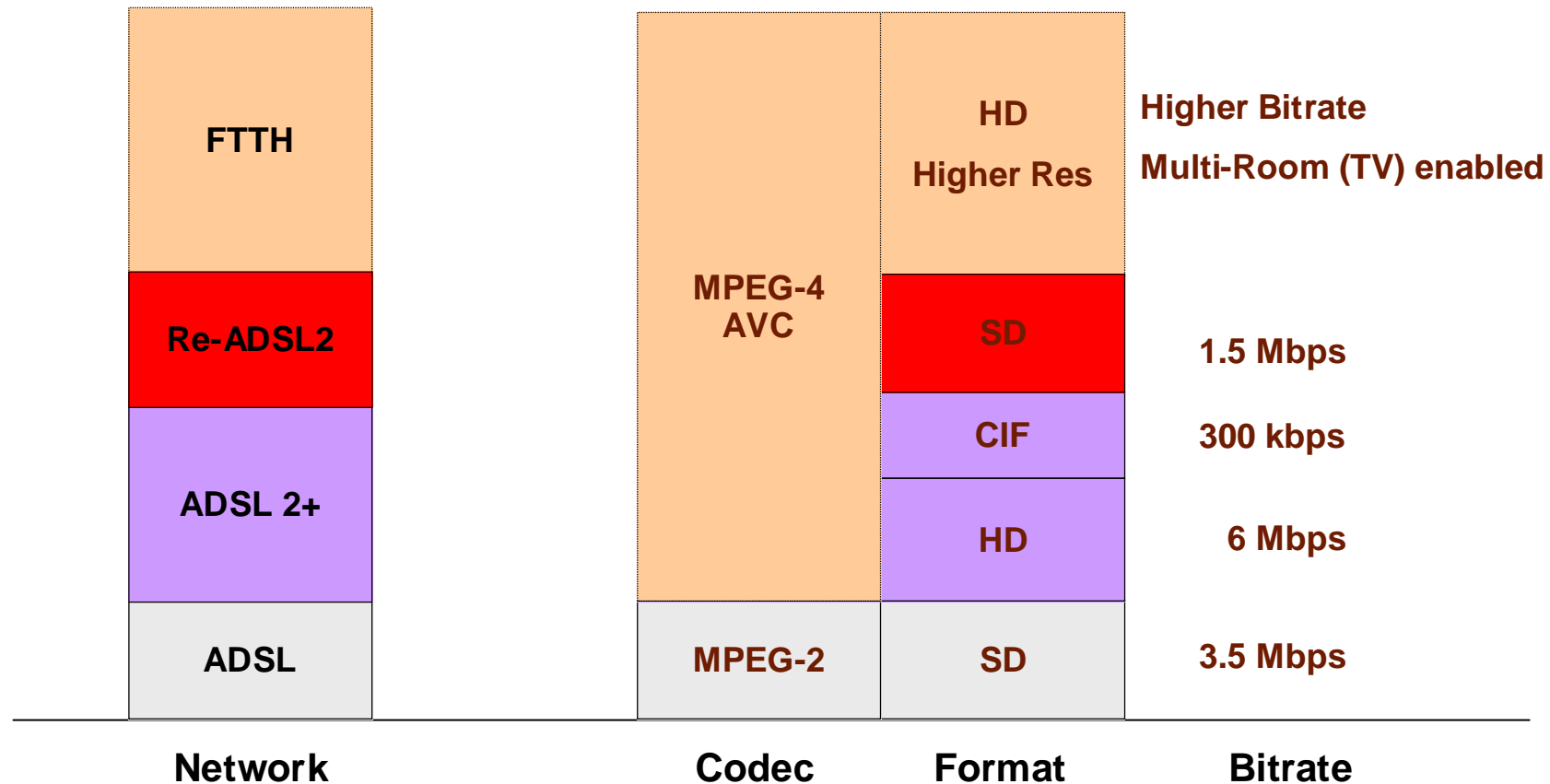
● Enhancing ADSL technology:

- Bandwidth: ADSL 2+
- Reach: Re-ADSL 2
- Quality of Experience: Interleaving, DslSafe



Broadcast Service: Multi Diffusion & Overlay Approach

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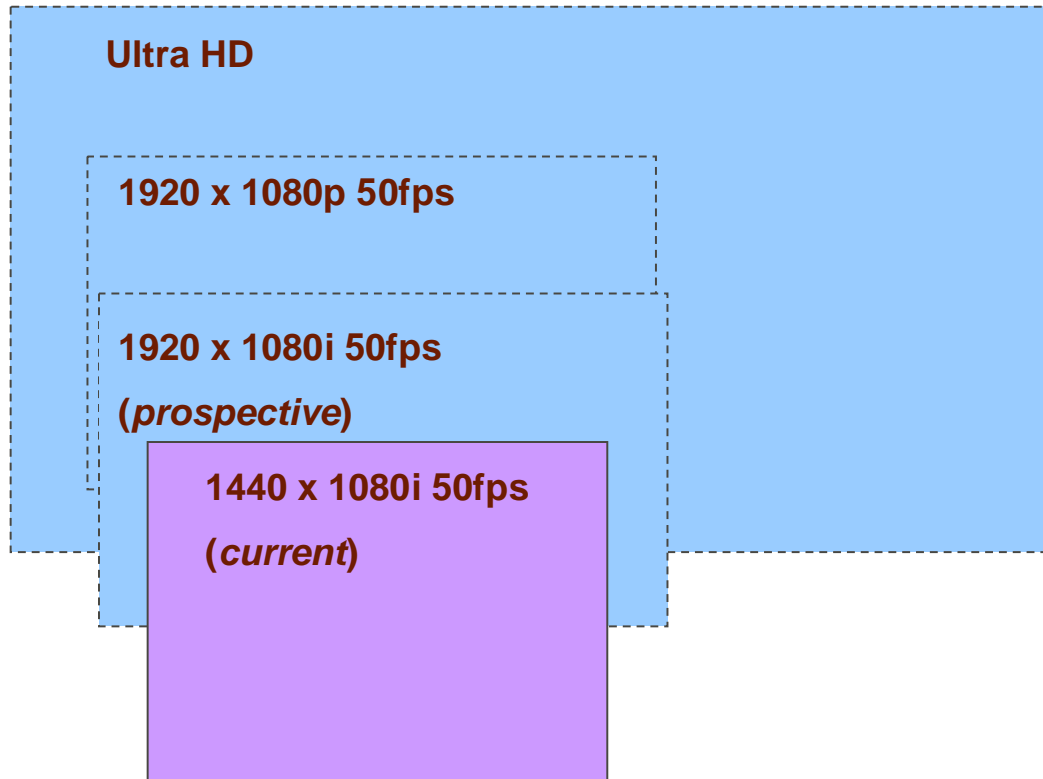


Multiple Streams for same content

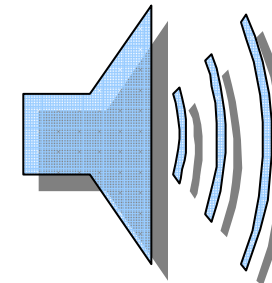


FTTH coming: opportunity to address future-proof video quality

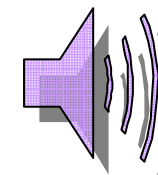
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Video Resolution Upgrade Enabled
by Virtual Unlimited bandwidth of Fiber



5.1 or more



Stereo

Audio Enhancement

On Demand TV Service

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- Driving the VOD concept in France
- > 1,000,000 items purchased per quarter
- Also introducing subscription VOD for series, music and cinema (*Free Home Video*)
- Content from Warner, Disney, Dreamworks, Sony Columbia, Fox, Studio Canal, Pathé, EuropaCorp, etc.
- VOD services of major industry actors:

CANALPLAY ▶

TF1 VISION

6
m6video.fr

I-CONCERTS™

VODEO TV

Broadcasting TV content over ADSL
TVODSL'08
08

On Demand TV Service technical

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Content Format	Standard	Format	Bitrate
HDTV Interlaced	MPEG-4 AVC	1080i	6 Mbps
HDTV Progressive	MPEG-4 AVC	720p	5 Mbps
SDTV	MPEG-4 AVC	SD	1.5 Mbps
	MPEG-2	SD	3.5 Mbps

Compression Driven by Content



- **H.264 Codec Key Tools**

- MBAFF - MacroBlock Adaptive Frame/Field
- PAFF - Picture-level Adaptive Frame/Field

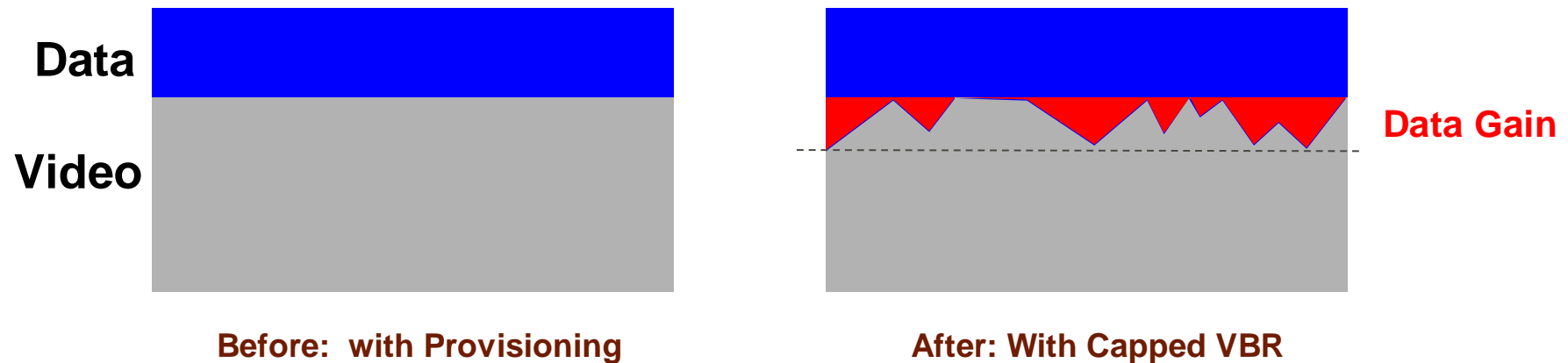


MBAFF- friendly content



**PAFF-friendly content
but MBAFF performing as well**

- **Opportunistic Data Increase enabled by Encoder**



Variable Bit Rate improves Web Browsing experience
Without Video Quality Decrease

Operation – Remote control / Maintenance

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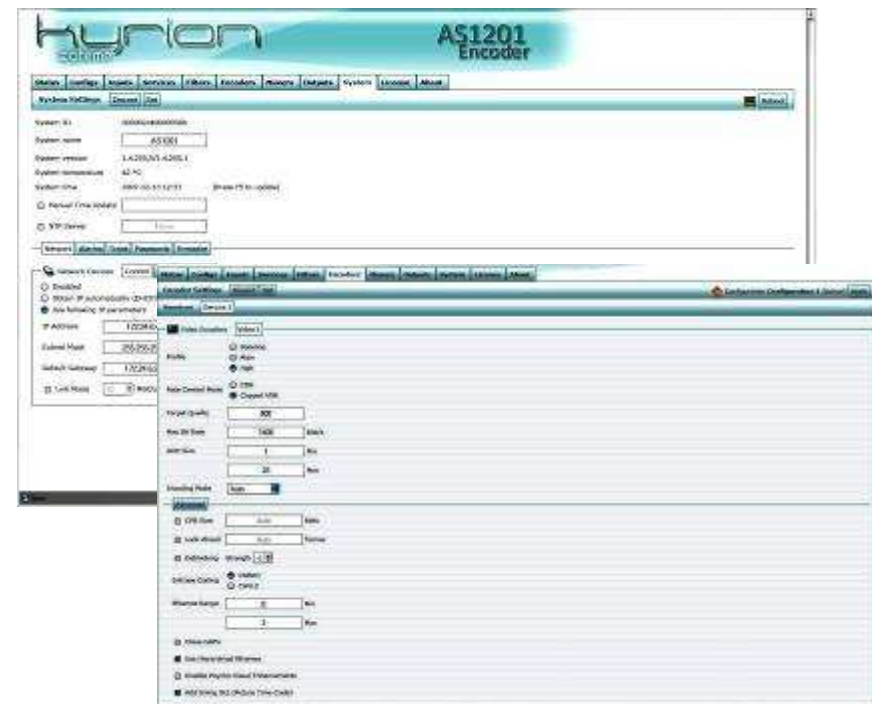
Satellite/cable TV head-end

Centralized encoding facilities
SDI links
On-site staff maintenance

Telco TV head-end

IP-only links
Remote encoding
Access limitations to hardware

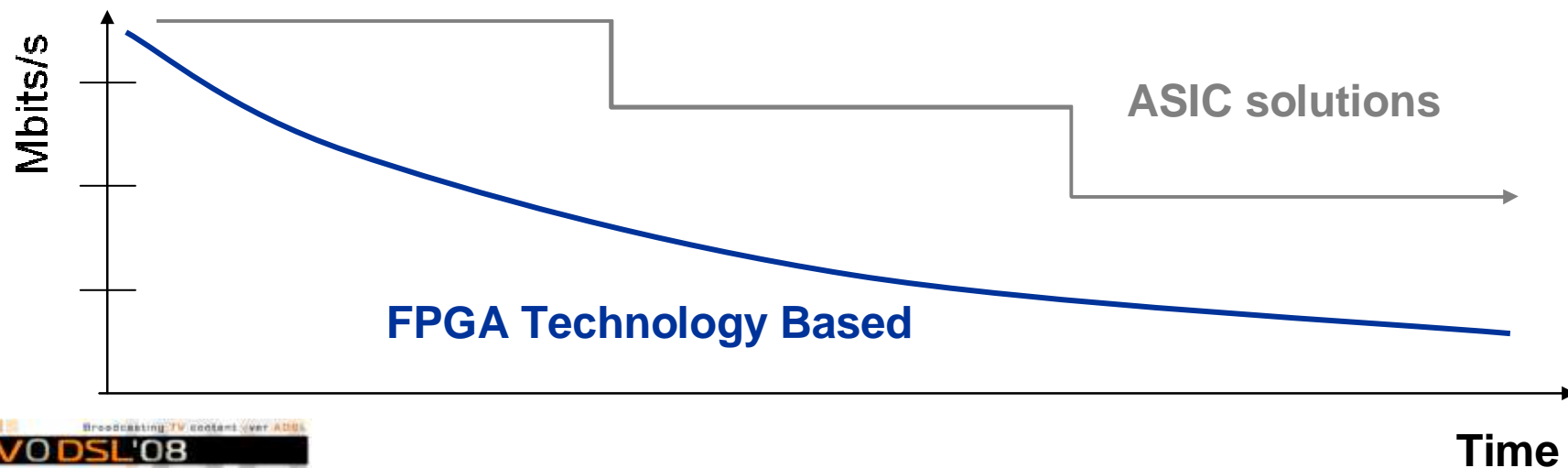
- **Operational constraints:**
 - ➔ Remote configuration and monitoring tool
 - ➔ Native integration of standard protocols (IP, HTTP)
 - ➔ Long-term reliability
 - ➔ Remote firmware upgrade



- **Firmware upgrade**

- Interoperability
- Codec improvement
- New Features: low res, mosaic

- **Programmable HW solution: FPGA vs ASIC**



Summary

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- **Multi codec & bitrate required for Live services**
- **Multi format driven by content source for On Demand services**
 - Need for Intelligent Video Acquisition solution
- **Operational aspect driven by network constraints and QoE**
- **Possibility of video compression improvement in the field**
 - Need for evolving platform with easy Upgrade path