

COMPUTEX Taipei Forum
NGN 2008 Technology Session

***Compression technology
immerses NGN consumer in HD***

Wednesday, June 4 1:00 PM -1:40 PM

Speaker :

Michael Thuresson

Product Planning Manager

NTT Electronics Corporation

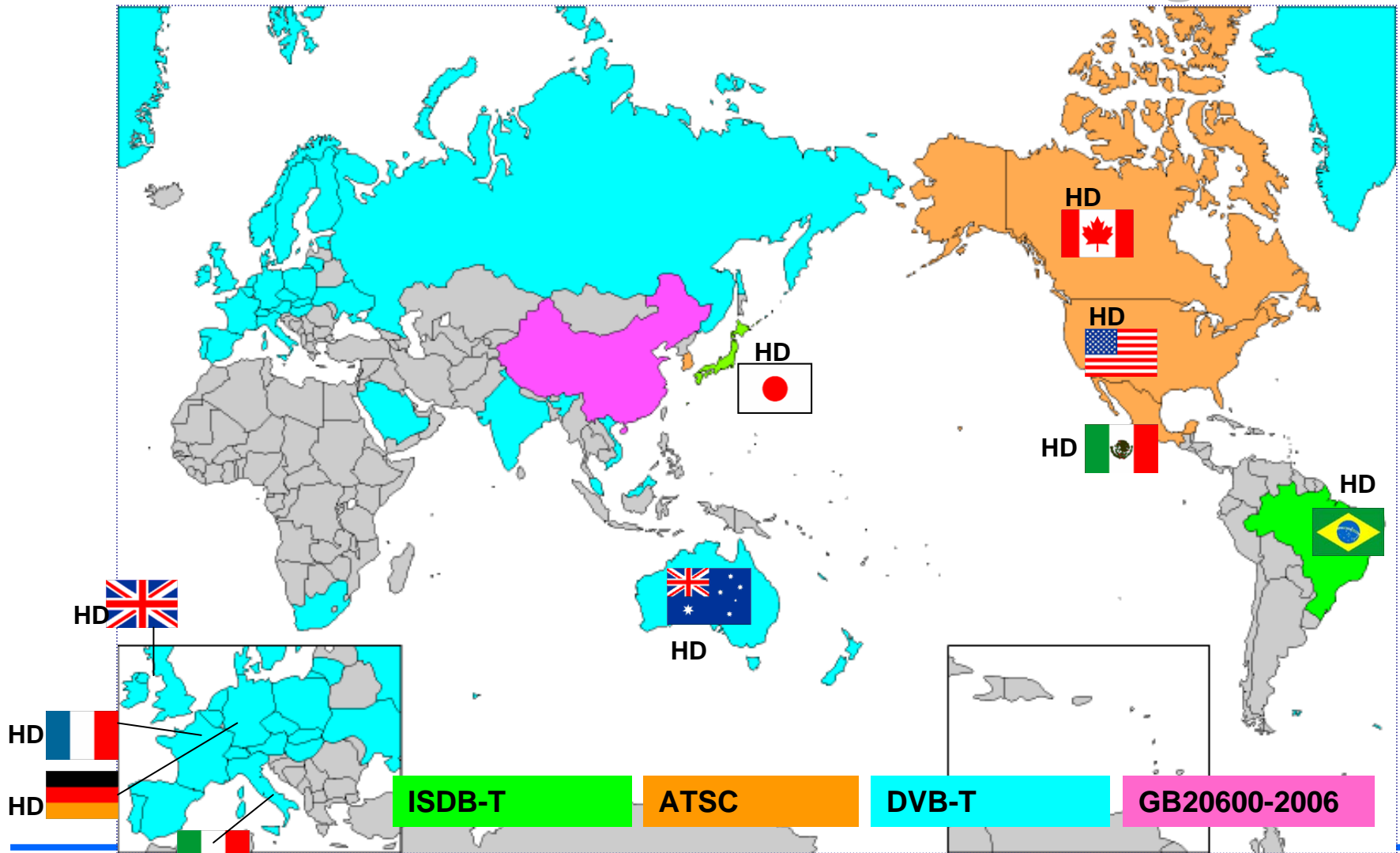
Increase Video Communications by Spreading NGN Service



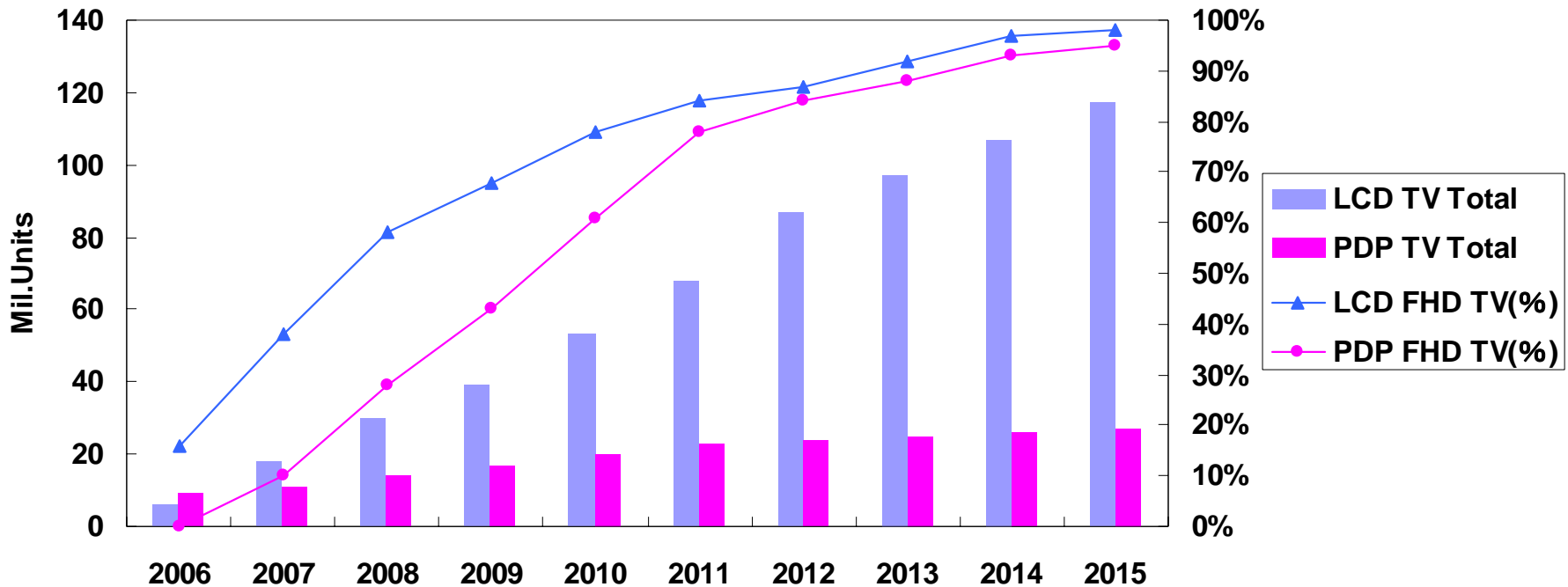
High Speed Network
Spread of Broadband
Bandwidth Guarantee



World Transition from Analog to Digital, SDTV to HDTV Broadcasting

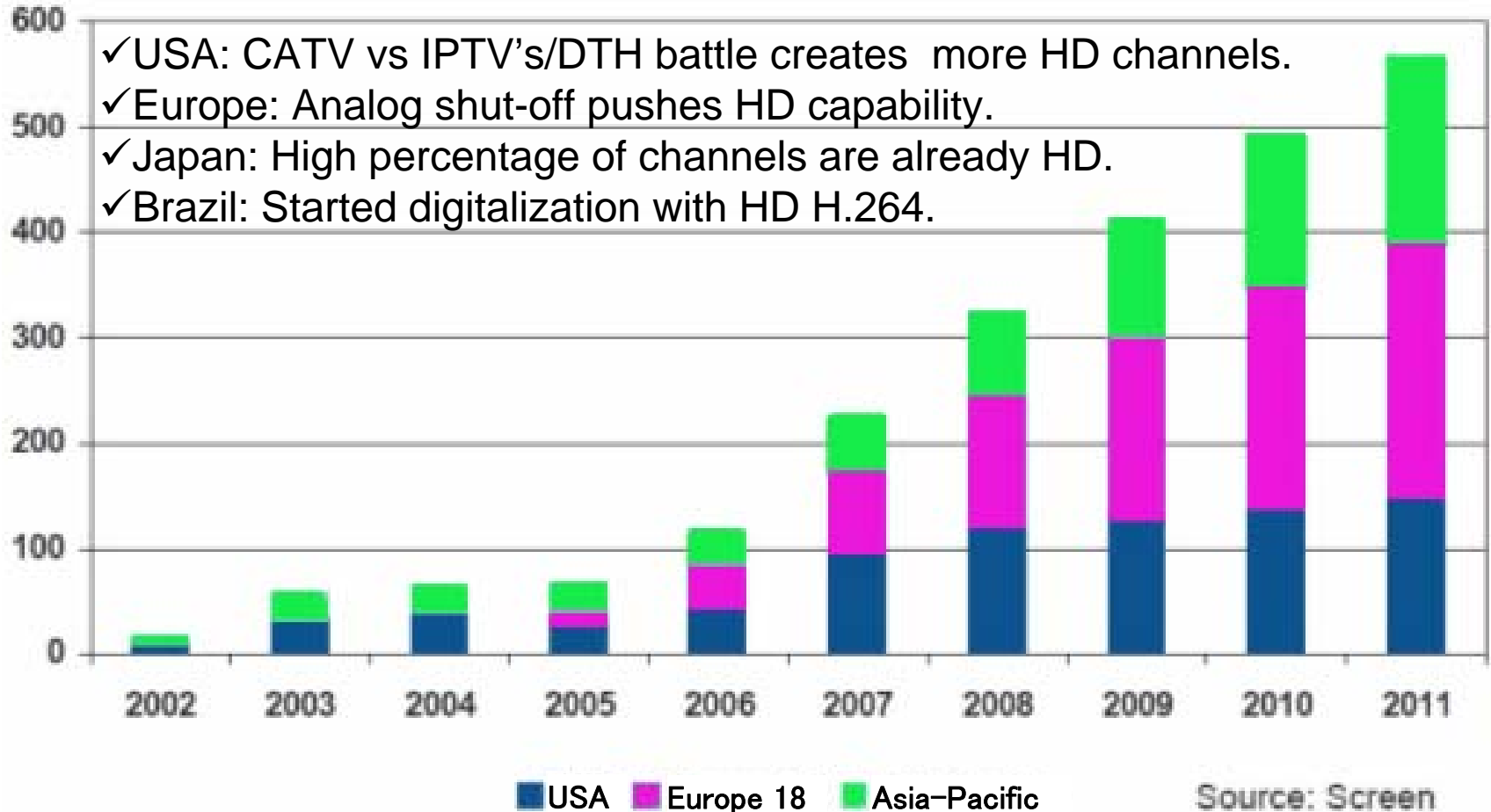


Worldwide Demand for 'full HD' TVs growing



Source : Display Bank

Worldwide Number of HD channels



Source: Screen Digest

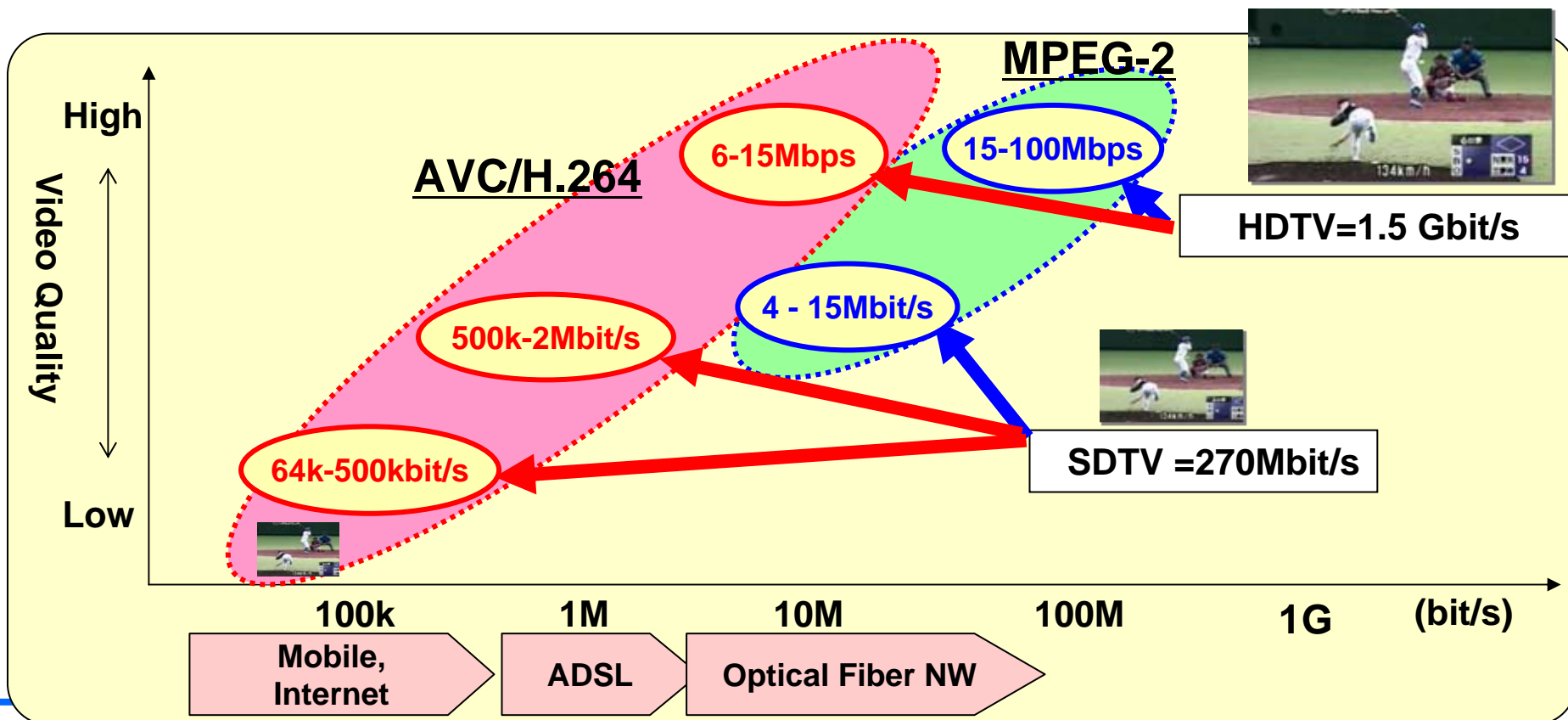
Compression needed for Video transmission or recording

- Should be compressed at Video transmission or recording because;
 - Original video data is **1.5Gbit/s**.

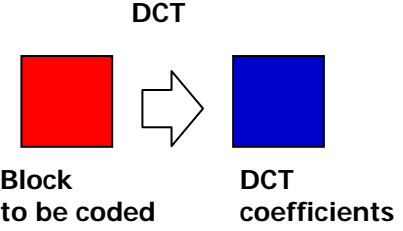
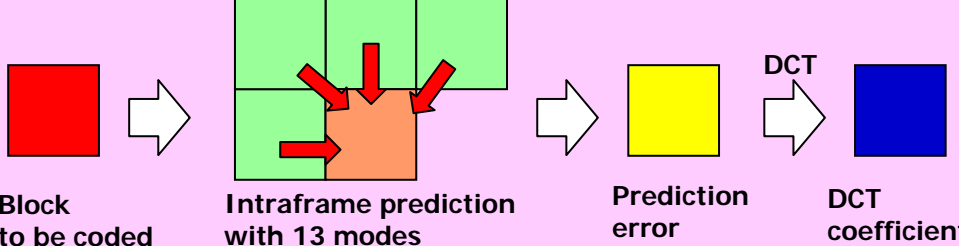
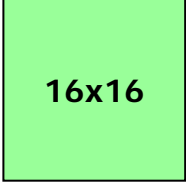
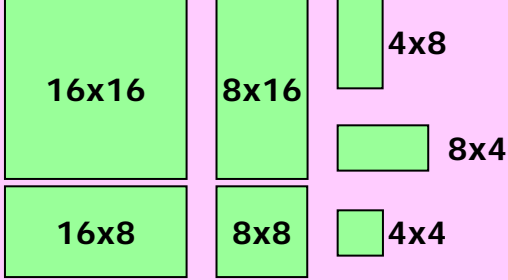
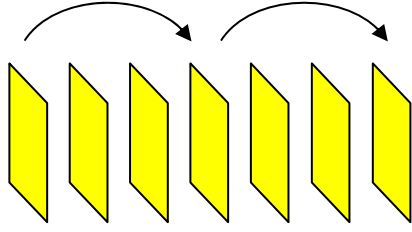
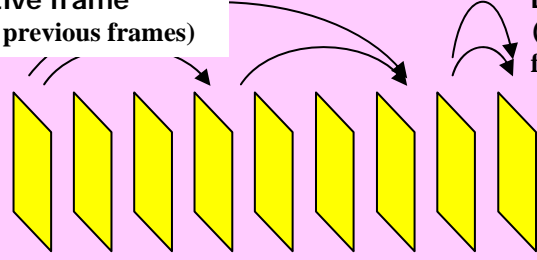


Compression needed for Video transmission or recording

- MPEG-2 is the most common compression technology.
- AVC/H.264 compression efficiency is more than double that of MPEG-2.

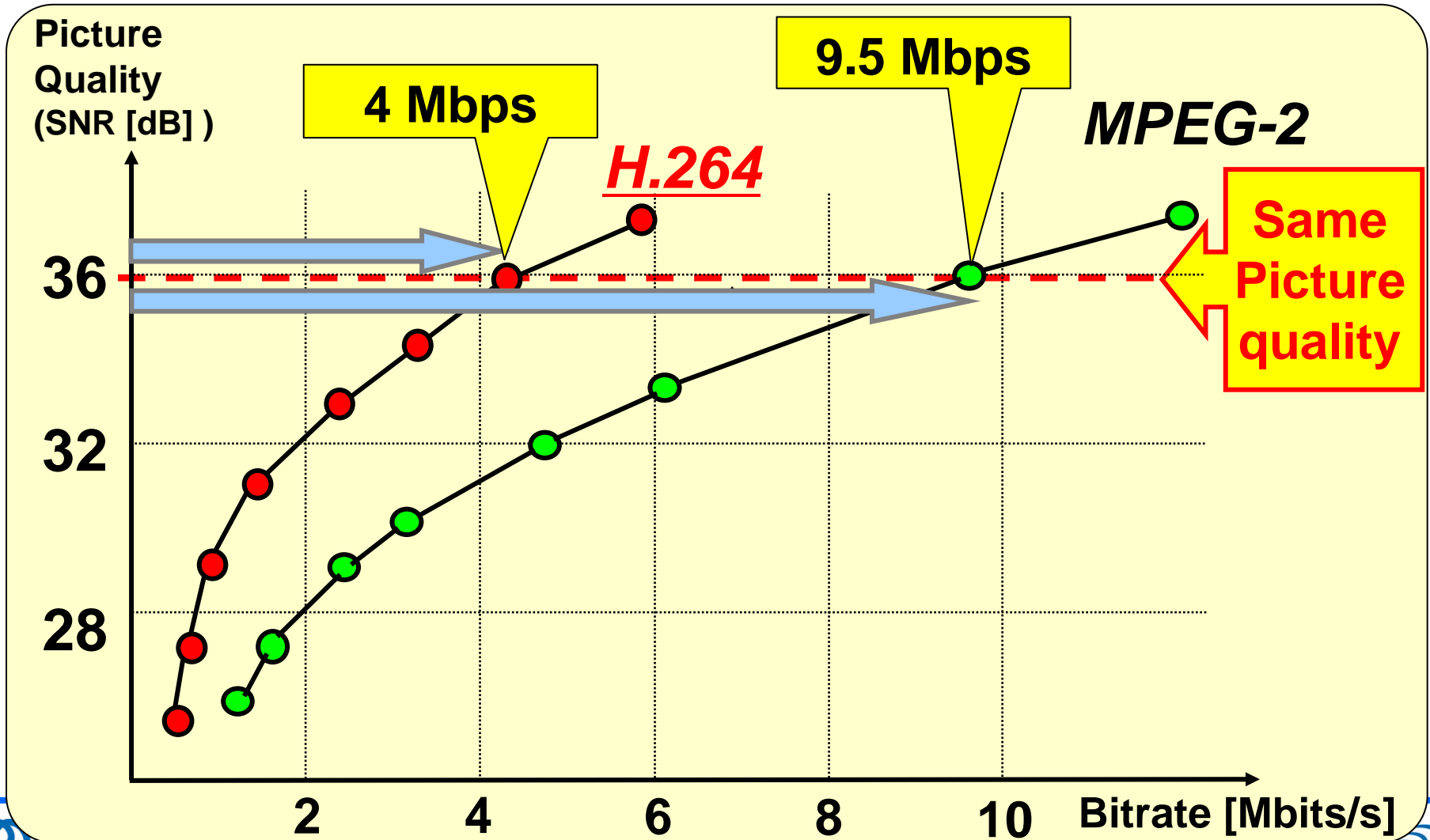


AVC/H.264 Advanced Technical Features

Features	MPEG-2	AVC/H.264
Intraframe prediction	<p style="text-align: center;">DCT</p>  <p style="text-align: center;">Block to be coded DCT coefficients</p>	<p style="color: red;">•Reduce the quantity of code</p>  <p style="text-align: center;">Block to be coded Intraframe prediction with 13 modes Prediction error DCT coefficients</p>
Variable block Size motion compensation	 <p style="text-align: center;">16x16</p>	<p style="color: red;">•Reduce the quantity of code for motion</p>  <p style="text-align: center;">16x16 8x16 4x8 16x8 8x8 8x4 4x4</p>
Extension of reference frame selection	<p style="text-align: center;">Uni-directional prediction</p>  <p style="text-align: center;">Bi-directional prediction from a previous frame and a future frame</p>	<p style="color: red;">•Reduce the quantity of code and improve the accuracy</p>  <p style="text-align: center;">Bi-predictive frame (from two previous frames) Bi-predictive frame (from a same reference frame)</p> <p style="text-align: center;">Bi-predictive frame (from a previous frame and a future frame)</p>

AVC/H.264 vs MPEG2

Coding Performance Comparison



AVC/H.264 vs MPEG2

Coding Performance Comparison

- AVC/H.264 compression efficiency is more than double that of MPEG-2.
 - But required processing power is 10-100 times that of MPEG-2's.
 - Even with the latest Core 2 Duo processor, real-time AVC/H.264 encoding is difficult.

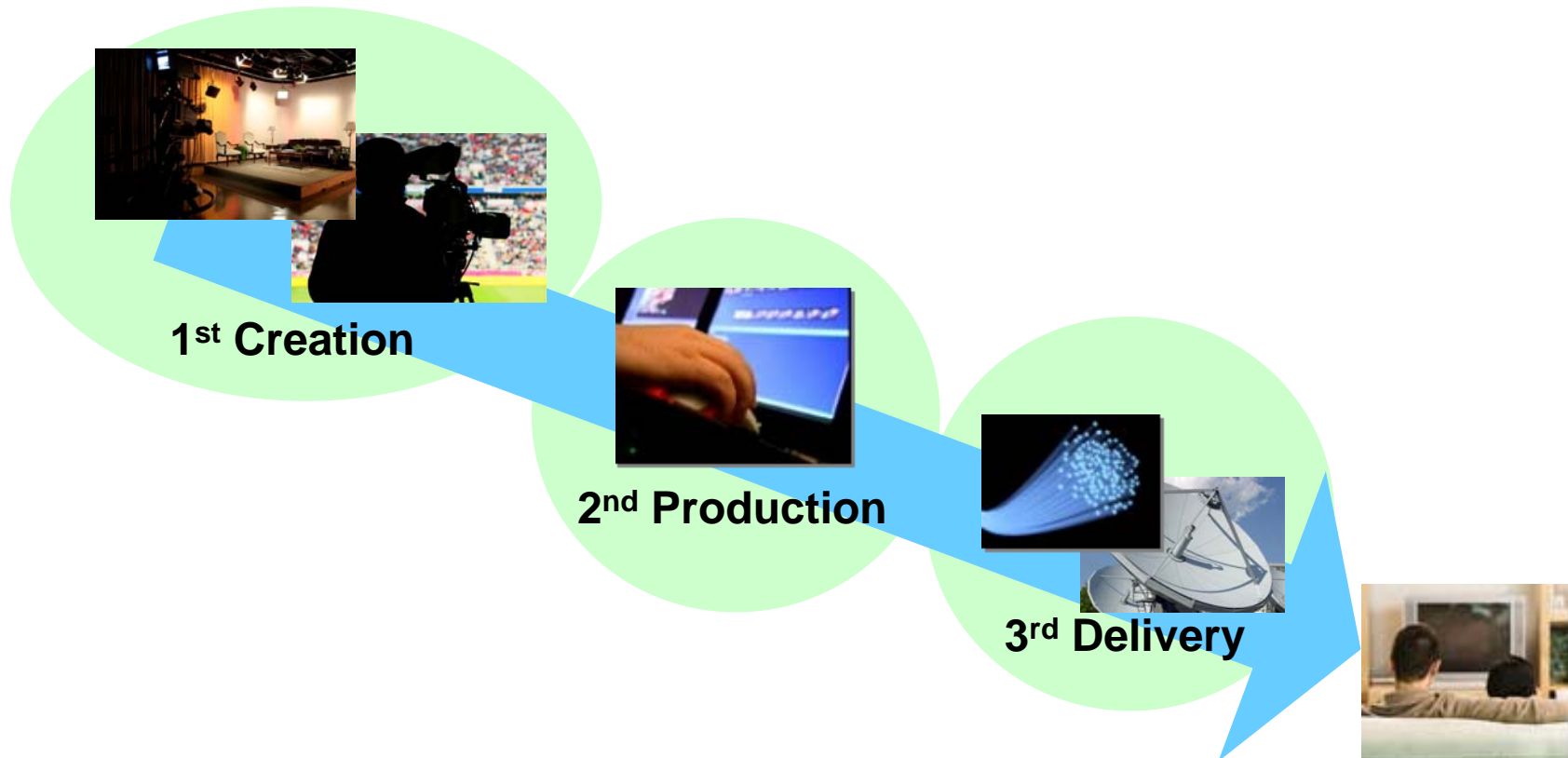


**High performance
Codec IC is required!**



From Content Provider to the Home

- At each step, the content needs to be encoded to decrease its huge data volume



From Content Provider to the Home

1st Creation

Maintaining high-quality video; requirements:

- ✓ Supporting 4:2:2 Chroma
- ✓ High Bitrate
- ✓ Low Latency



1st Creation



2nd Production



3rd Delivery



From Content Provider to the Home

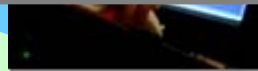
2nd Production

Maintaining high-quality video; requirements:

- ✓ Supporting 4:2:2 Chroma
- ✓ High Bitrate
- ✓ Supporting Multiple Video Formats



1st Creation



2nd Production



3rd Delivery



From Content Provider to the Home

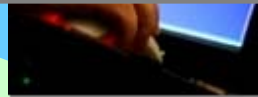
3rd Delivery

To transmit high-quality video within limited bandwidth; requirements:

- ✓ **Low Bitrate**
- ✓ **Variable Bitrates for Statistical Multiplex**



1st Creation



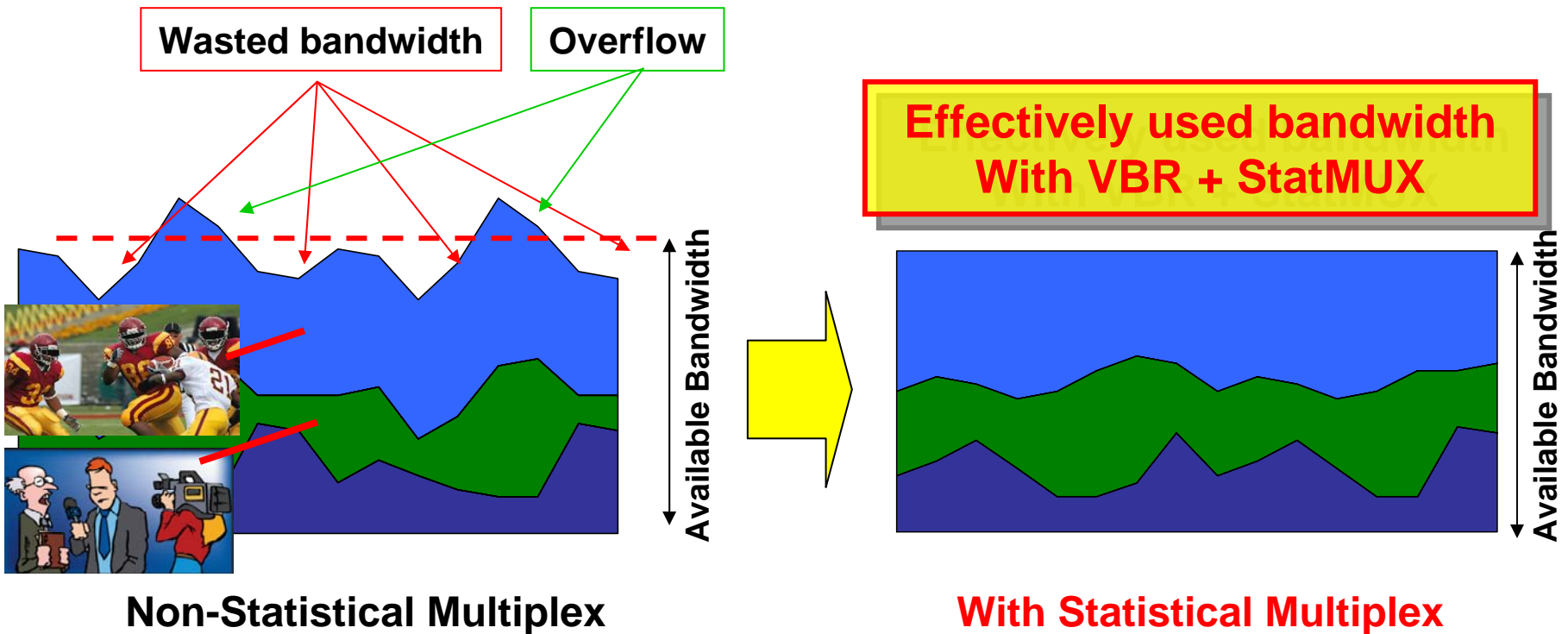
2nd Production



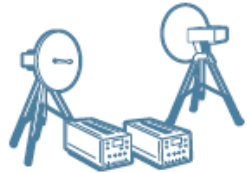
3rd Delivery



From Content Provider to the Home Statistical Multiplexing Technology



From Content Provider to the Home



**Microwave Transmitter/
Receiver**



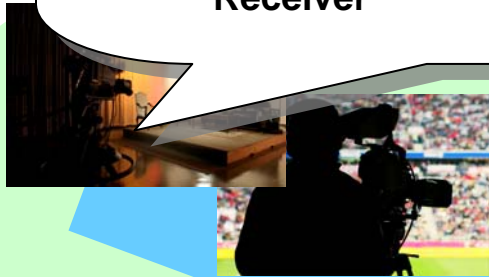
Professional Camera



**Video Server,
Ingest/Playout Server**



Real-time Encoder



1st Creation



2nd Production



3rd Delivery



From Content Provider

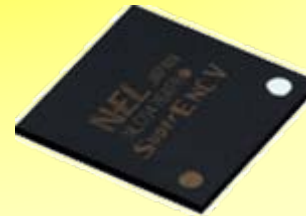
to the User

**High
Video Quality**

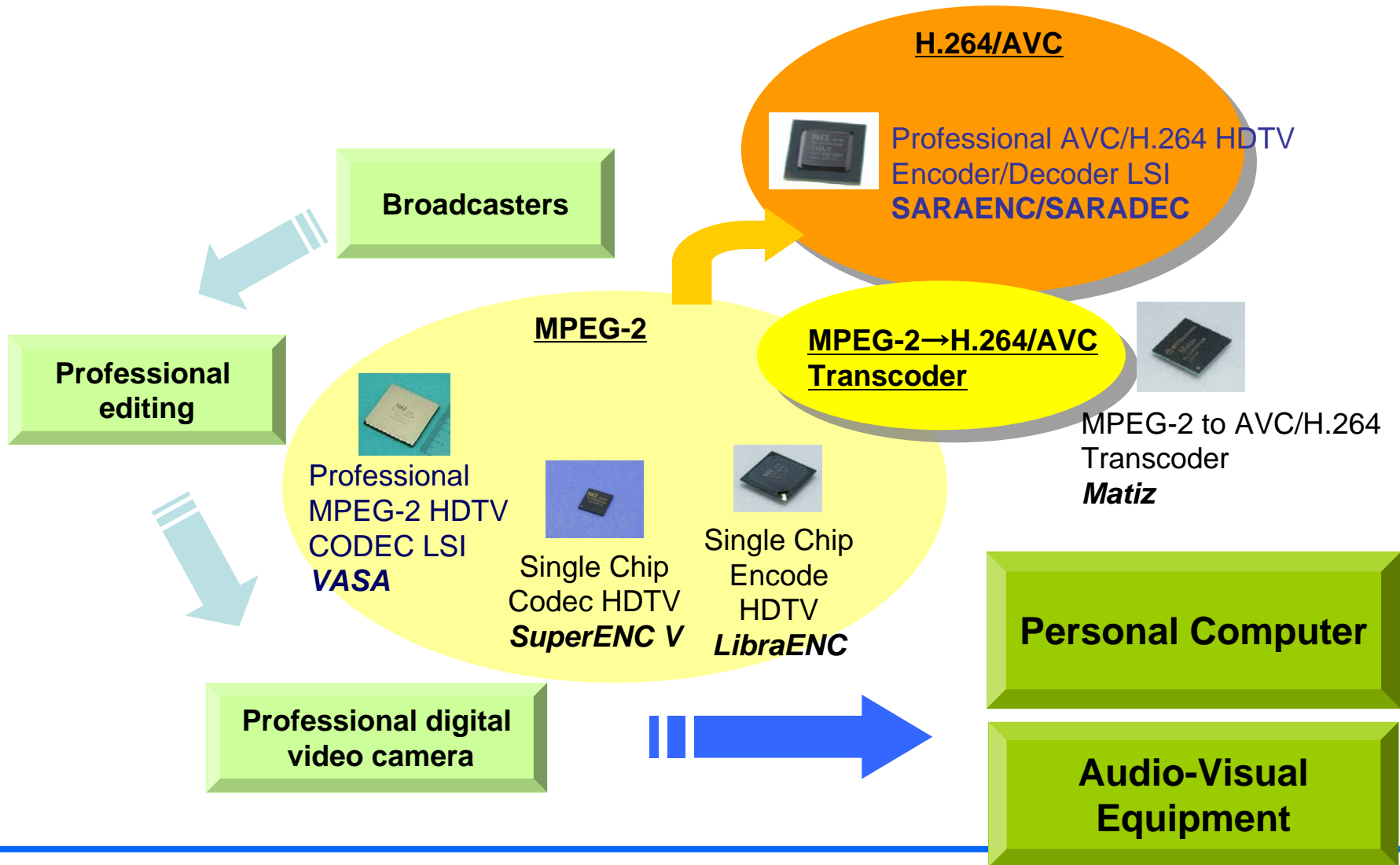


**Super
Low Latency**

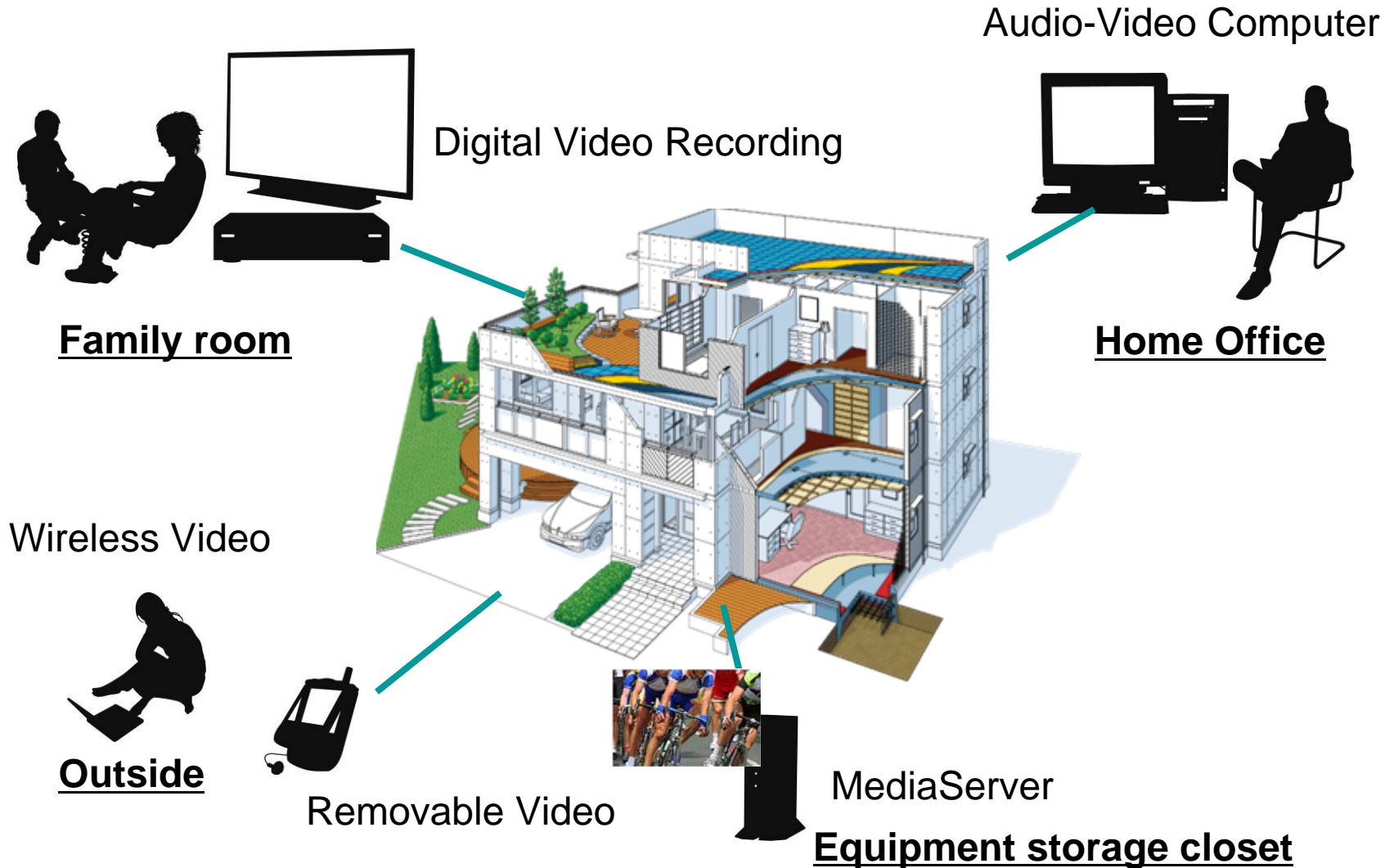
**Our professional codec devices
cover all professional products.**



NTT Electronics Video Compression Development



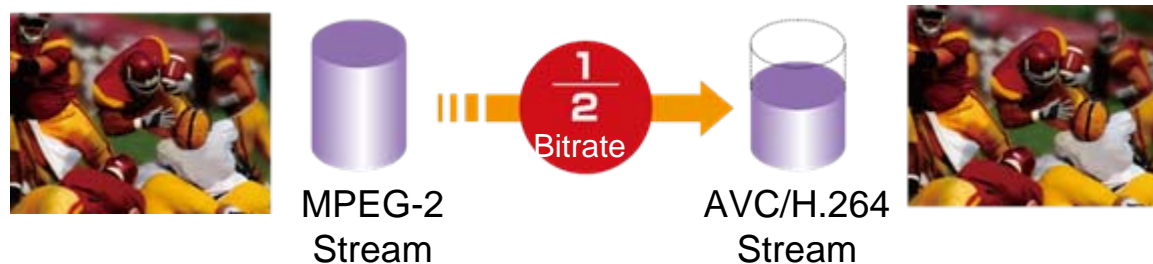
Home Network & Codec Technology



Home Network & Codec Technology

MPEG-2 to AVC/H.264 Transcoding

- Optimize storage environment with MPEG-2 to AVC/H.264 Transcoding technology
 - Amount of HD content is exploding
 - PVR: Demand for viewing a missed program by a time shift play



Half the bit rate and double the compression ratio

Compression Technology Immerses More Video Products in HD

Digital Home



AV PC



**MPEG-2
AVC/H.264**

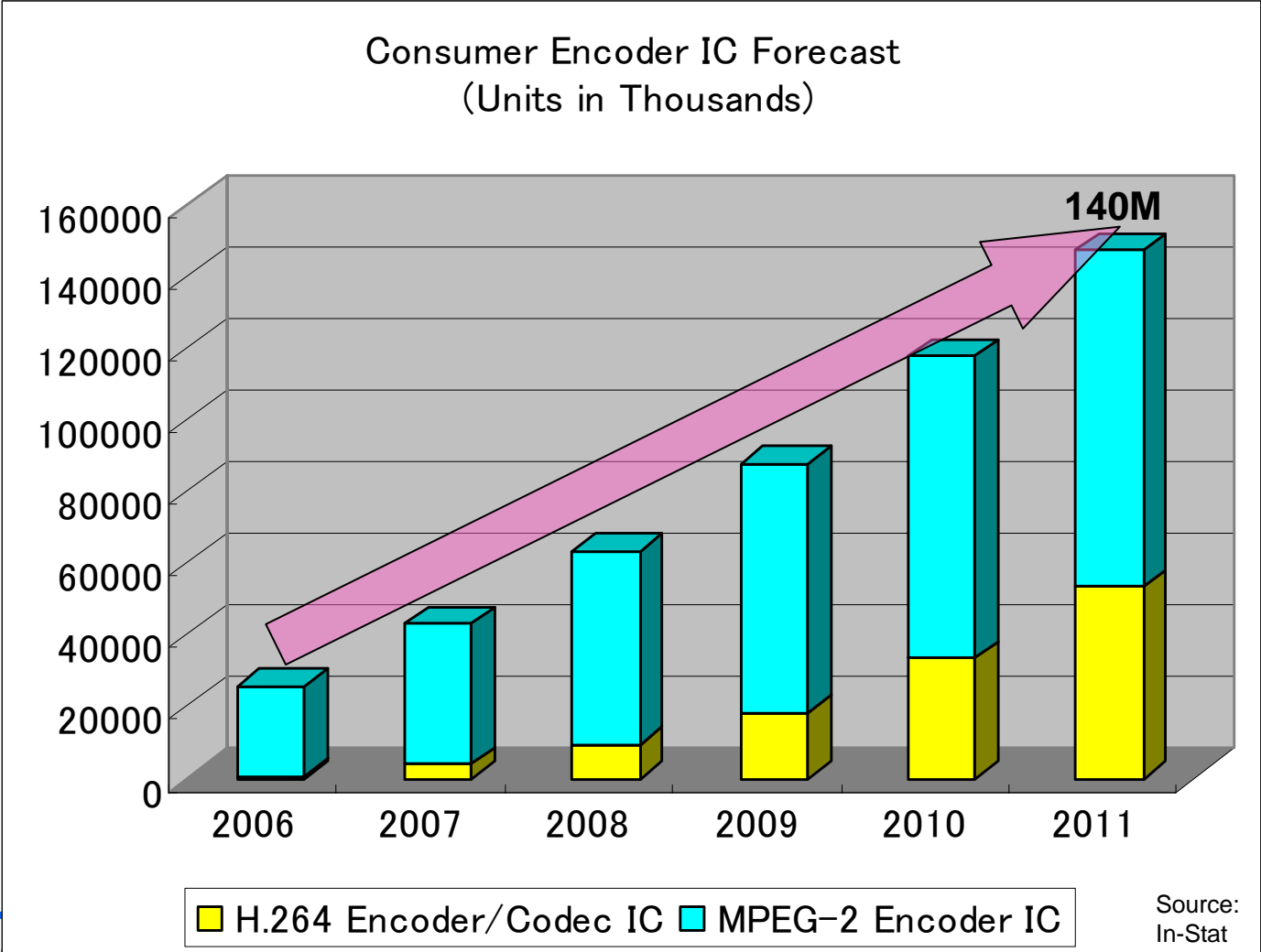
Video Surveillance



HD World

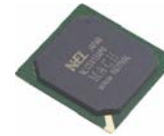


Consumer Encoder IC Forecast



Applications

Wireless TV



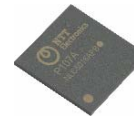
MACH

HDD Video Recorder
STB with PVR



Matiz

AV Computer



PINEA

Handy-cam



SuperENCV

NTT Electronics, Co., Ltd.

1841-1, Tsuruma, Machida-shi, Tokyo

194-0004, JAPAN

TEL: +81-42-796-4889

FAX: +81-42-796-4971

Email: sales_global@lsig.nel.co.jp

For more on NTT Electronics, please visit

<http://www.nel-world.com/products/video/index.html>