

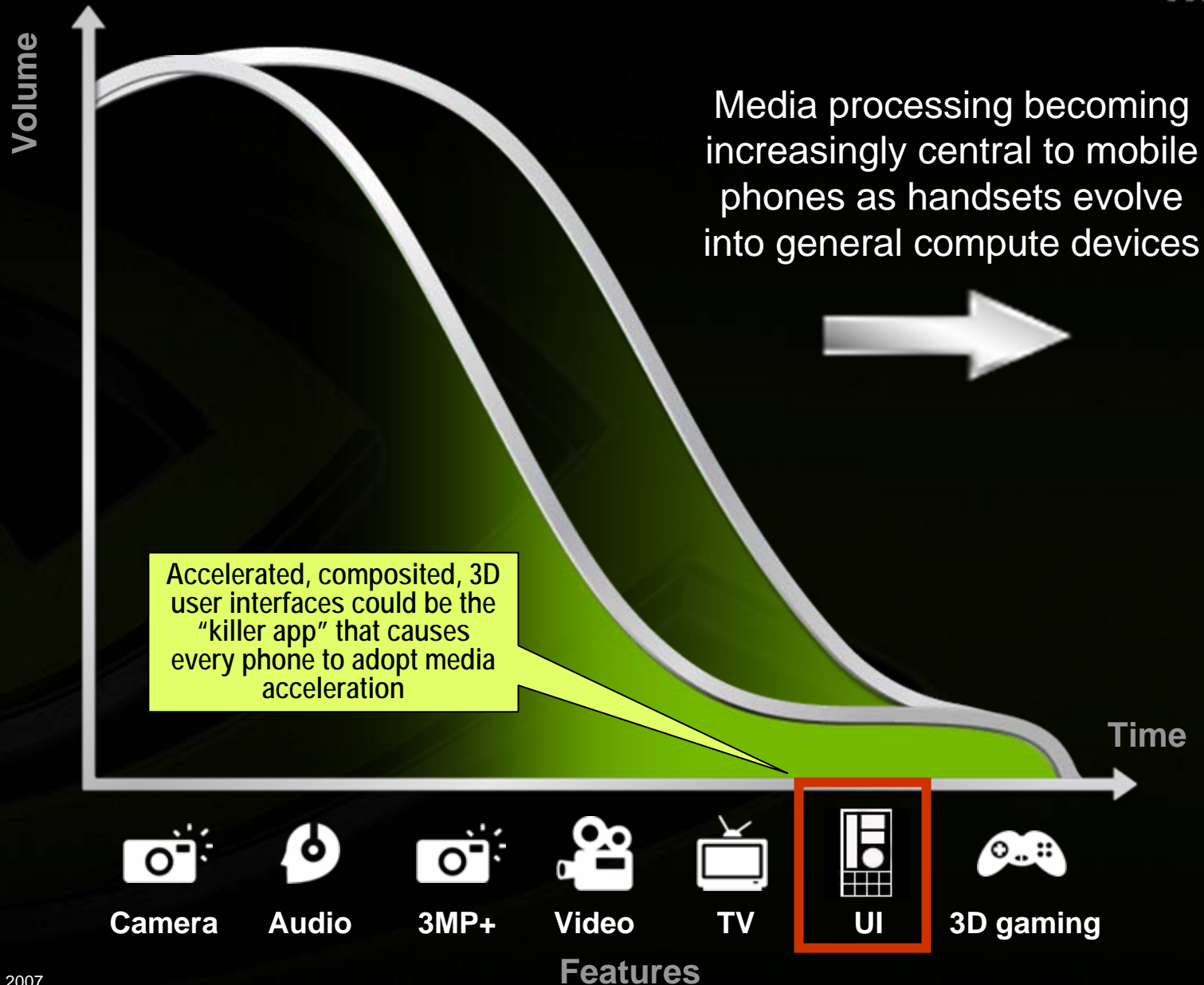


**NVIDIA**®

## **Mobile Media Trends**

**ETF, Orlando, March 2007**

# Mobile Media Demand



# New Breed Mobile Applications



Breakthrough software will not treat HH as small consoles/PCs

- **Mobility**
  - **Navigation** with GPS location awareness
- **Connectedness**
  - Unique information flow and social interactions – portals to **WoW, YouTube, Second Life, MySpace, Cyworld**
- **Multiple sensors**
  - Cameras for video and images, sound – **Augmented Reality**

**Handsets will need sophisticated mixed media acceleration**



A GPS phone processes OpenMAX video to recognize and overlay landmark information over high-quality OpenVG maps

# Java Roadblocks



Java is enabling only 20% of 3D graphics and media performance to be realized

Accelerated Native

Seamlessly accelerated mixed-media Java  
Compelling native mixed-media applications  
Accelerated UI

x3-5 Performance

Accelerated Java

Higher quality games

x2-20 Performance

Un-accelerated Java

Simple 2D Games



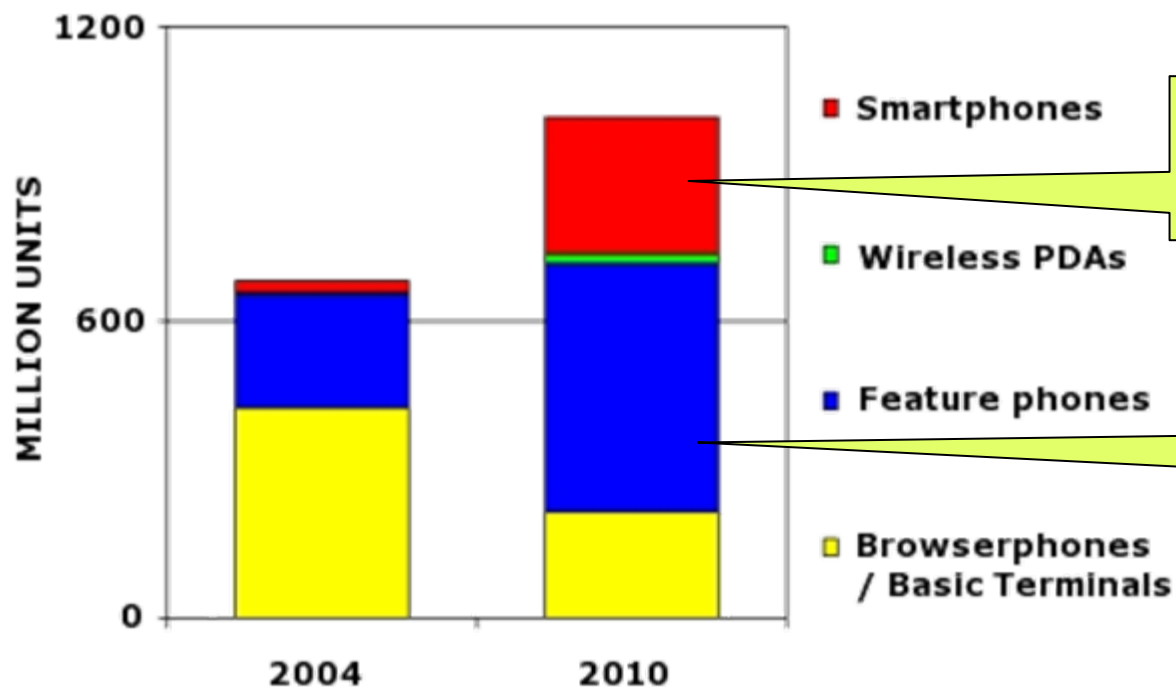
Measured by Kishonti	Java (fps)	OpenGL ES (fps)	Native Advantage
Nokia N93	18.6	77.8	x4.2
Sony Ericsson M600	6.0	30.6	x5.1

GLBenchmark – direct port of identical Java benchmark

# Fragmentation

- Every handset is unique to program
  - Differences in OS, Java and media functionality
- Severe platform fragmentation exists today
  - ISVs need 100s (even 1000s) of source variants of each title

Global Handset Sales by Device Type

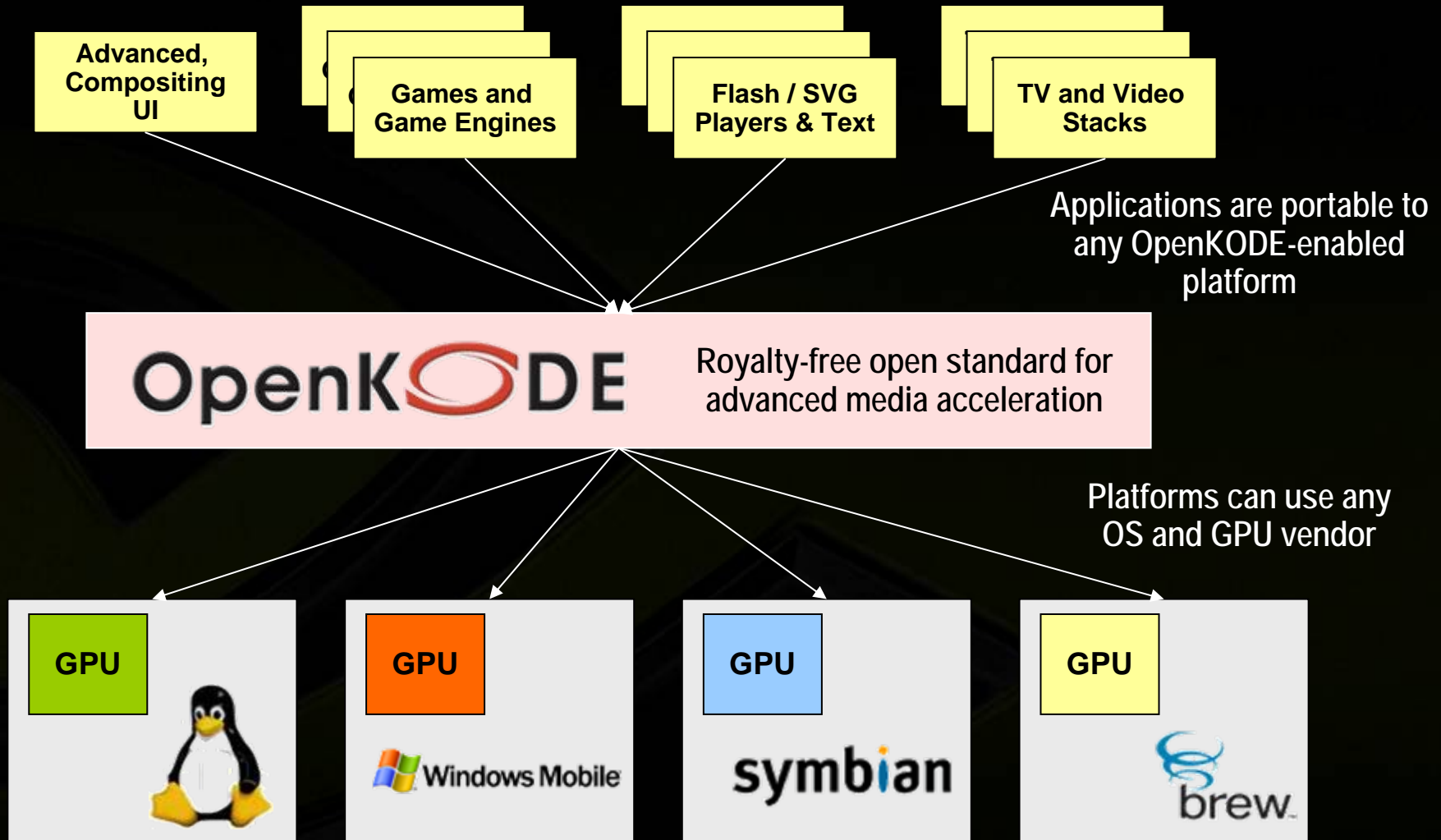


Source: Strategy Analytics, Oct. 2005

Symbian 7, 8, 9, UIQ, S60  
PocketPC / Windows Mobile / WinCE  
Many Linux variants (and growing)  
Java MIDP-1, MIDP-2, JSR fragmentation

Numerous RTOS with no consistently defined OS abstraction or media portability – Nucleus, Synergy etc.

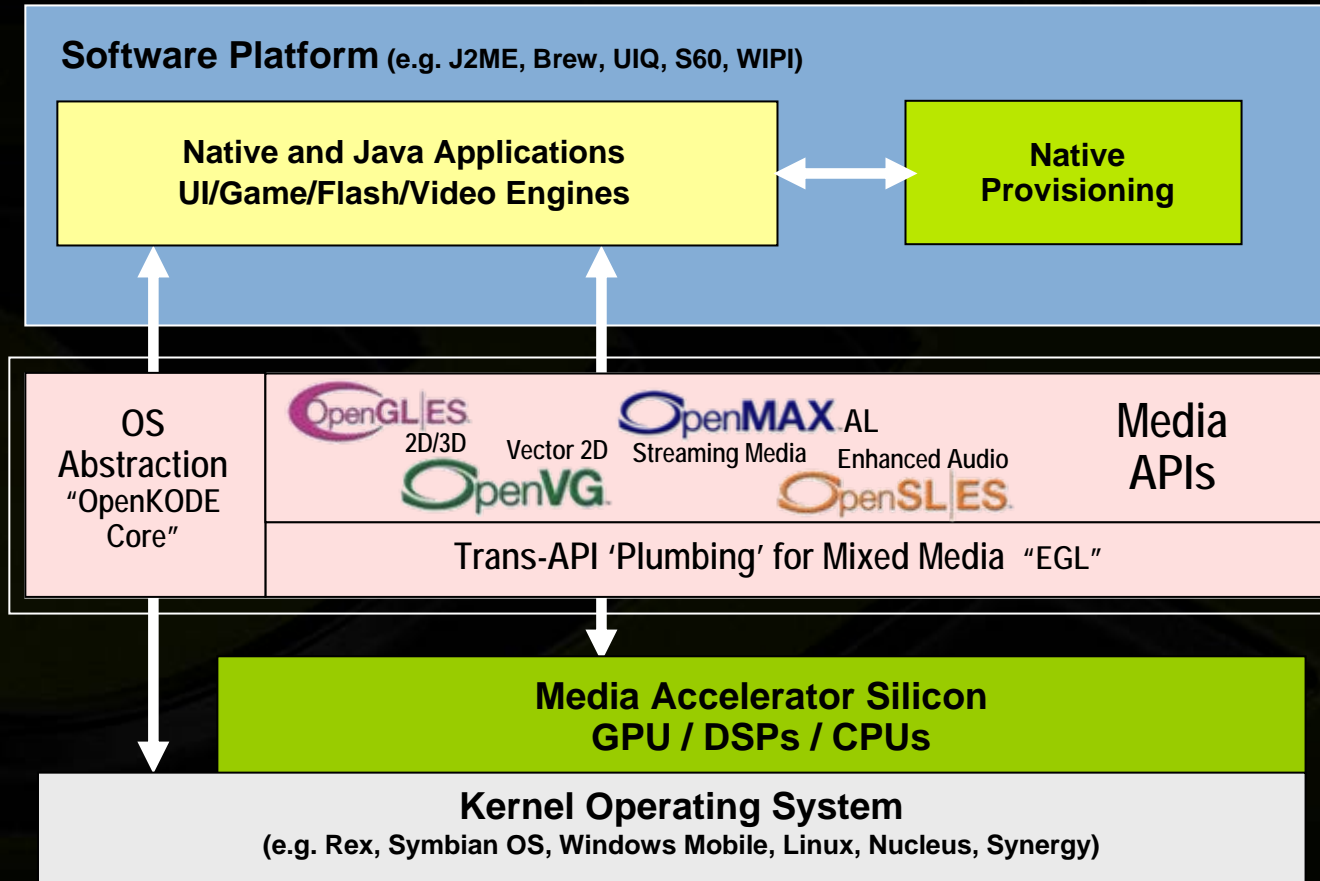
# Open Standard Media Acceleration





# OpenKODE = “DirectX for Handheld”

Except its an open standard, cross-platform, royalty-free and streamlined for handheld devices

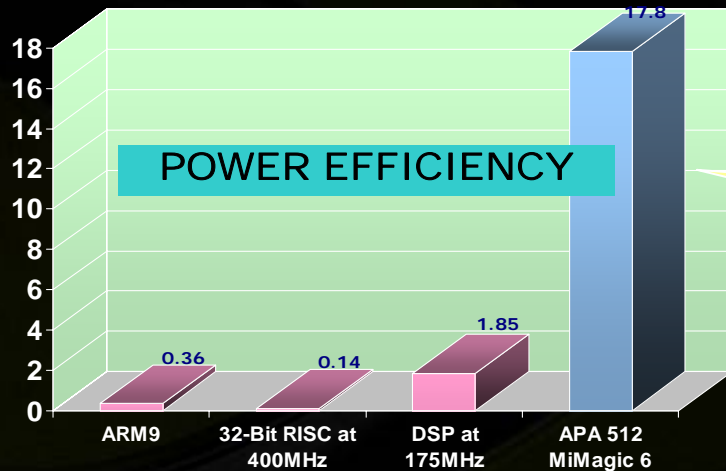


**OpenKODE**  
Full API set for NATIVE  
media applications

# Advantages of Media Acceleration



**Faster Performance at Higher Quality**  
Hardware delivers at least 10 times the performance of software – even on low-cost systems with low-end CPUs



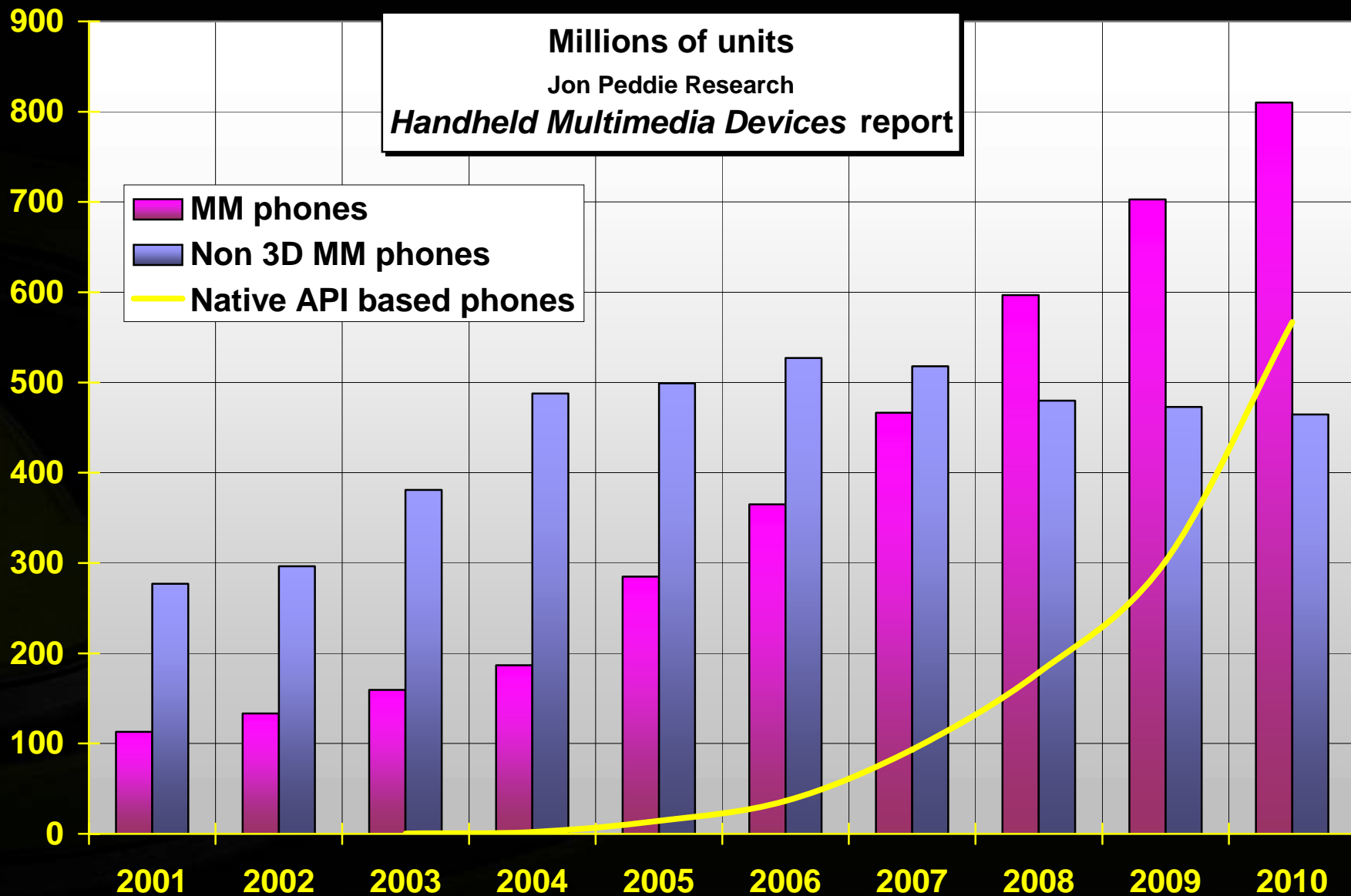
**Less Power**  
Hardware accelerators exploit parallelism in a media pipeline to give a x10 increase in power efficiency over software

**Better User Experience**  
Smaller screens need more advanced graphics processing per pixel





# Market Penetration of Native APIs



# NVIDIA Application Processors

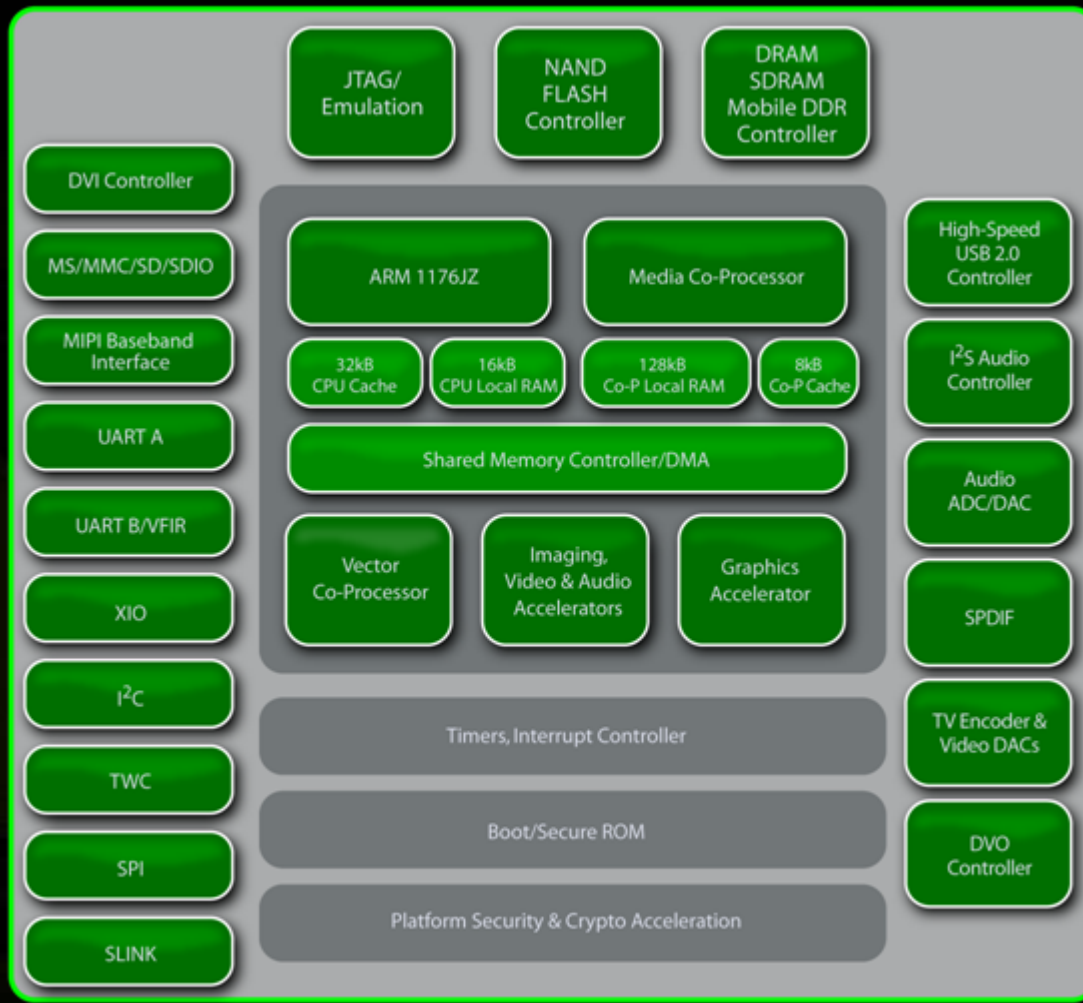


- NVIDIA recently acquired PortalPlayer

- Already launched first application processor

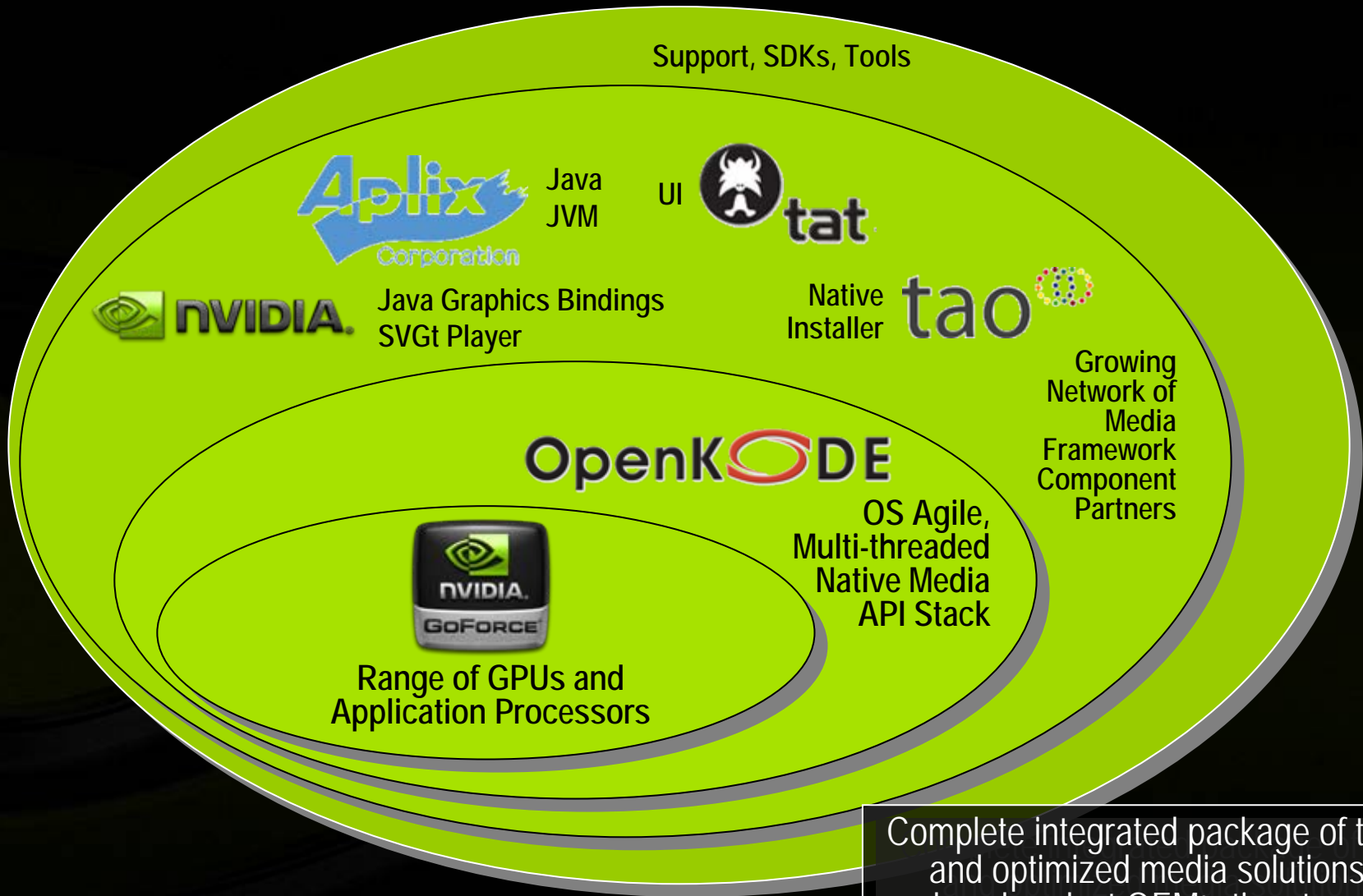
- GoForce 6100 is first member of application processor family

# GoForce 6100 Application Processor



- Ultra-low power video and audio playback
- 250 MHz ARM1176JZ-S
- Hardwired Media co-processor
- H.264 VGA Decode
- VC-1 QVGA decode
- Up to 10 mega-pixel camera
- Fully integrated, high quality analog audio subsystem
- Integrated USB 2.0/OTG PHY
- Integrated TV encoder + DACs
- 2D Graphics Acceleration
- Support for multiple DRM formats
- Cyclone, WinCE

# NVIDIA Mobile Media Solution



Complete integrated package of tested and optimized media solutions to reduce handset OEM's time to market

# Thank You!



- **Come to the Khronos session this afternoon for more details on all the Khronos handheld standards – including OpenKODE**

# Continued momentum

New devices for 2007



**O2 XDA Flame**  
GoForce 5500



**MOTORAZR Maxx**  
GoForce 4800



**MOTORAZR V3xx**  
GoForce 4800

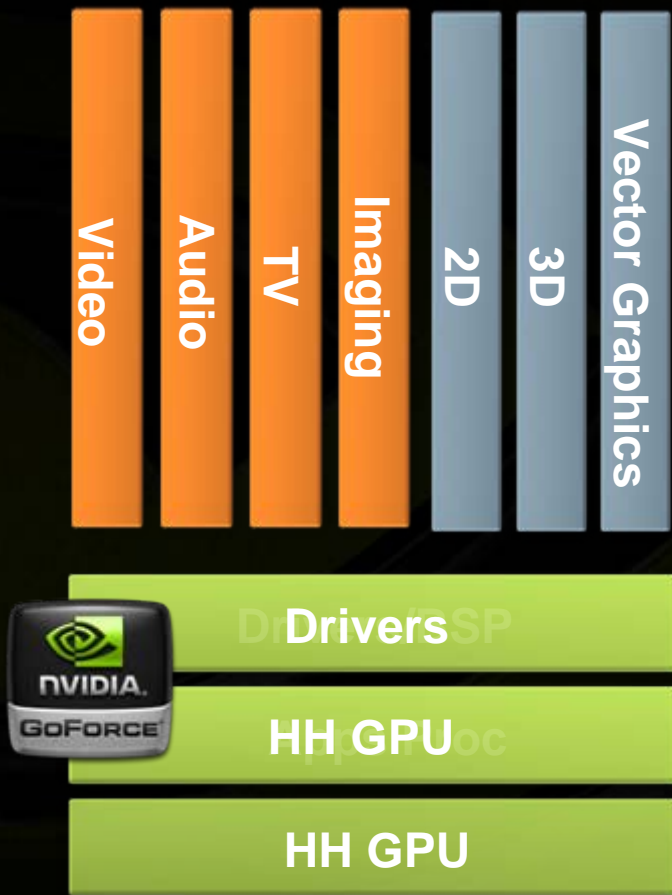


**Kyocera W52K**  
GoForce 5500



**Modeo DVB-H**  
GoForce 5500

# Strategic Investment



Aug 2003

- Founded in 1997
- San Jose, CA
- 80 employees
- Low Power graphics devices



Mar 2006

- Founded in 2000
- Pune, India
- 200 employees
- Embedded multimedia SW



HYBRID graphics

Mar 2006

- Founded in 1994
- Helsinki, Finland
- 37 employees
- Embedded graphics SW



Jan 2007

- Founded in 1999
- HQ San Jose, CA
- 268 employees
- Personal media devices