

ARM CPU – Now and Future

Sanghi(Sky) Lim

ARM Korea

Embedded SW Insight Conference

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It's Not Just ARM... Diversity = Strength

Software, Training and Consortia Partners

This panel features a large collection of logos for partners in software, training, and consortia. Notable logos include Microsoft, Intel, and various academic and research institutions. The logos are arranged in a grid-like fashion, filling the panel with a diverse range of organizational identities.

Silicon Partners

This panel displays a wide array of logos for silicon partners. It includes logos for major semiconductor manufacturers such as Intel, AMD, and ARM, alongside numerous other companies in the silicon ecosystem. The logos are densely packed, representing a broad spectrum of silicon-based technologies and companies.

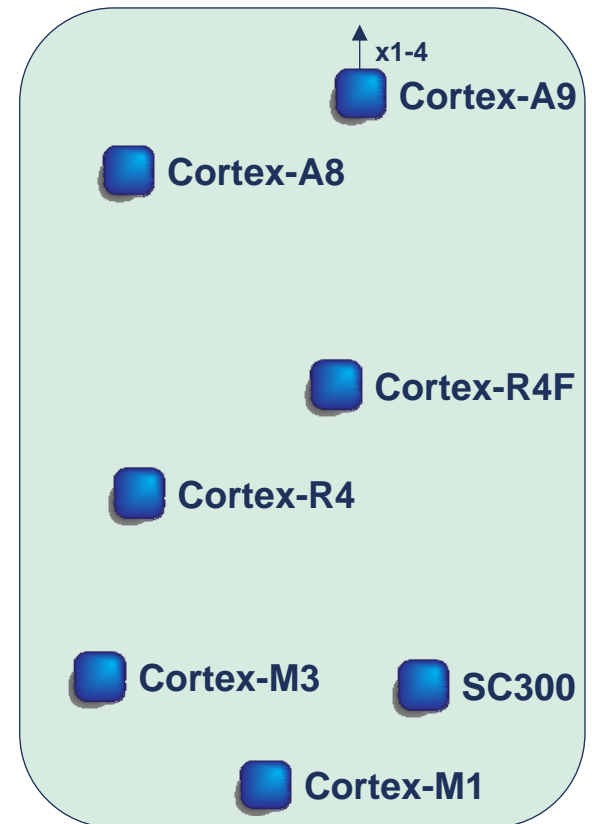
Design Support Partners

This panel shows a variety of logos for design support partners. It includes logos for EDA (Electronic Design Automation) tools and design services, such as Cadence, Synopsys, and others. The logos are arranged in a grid, highlighting the extensive network of design support partners.

ARM Cortex Family of Processors

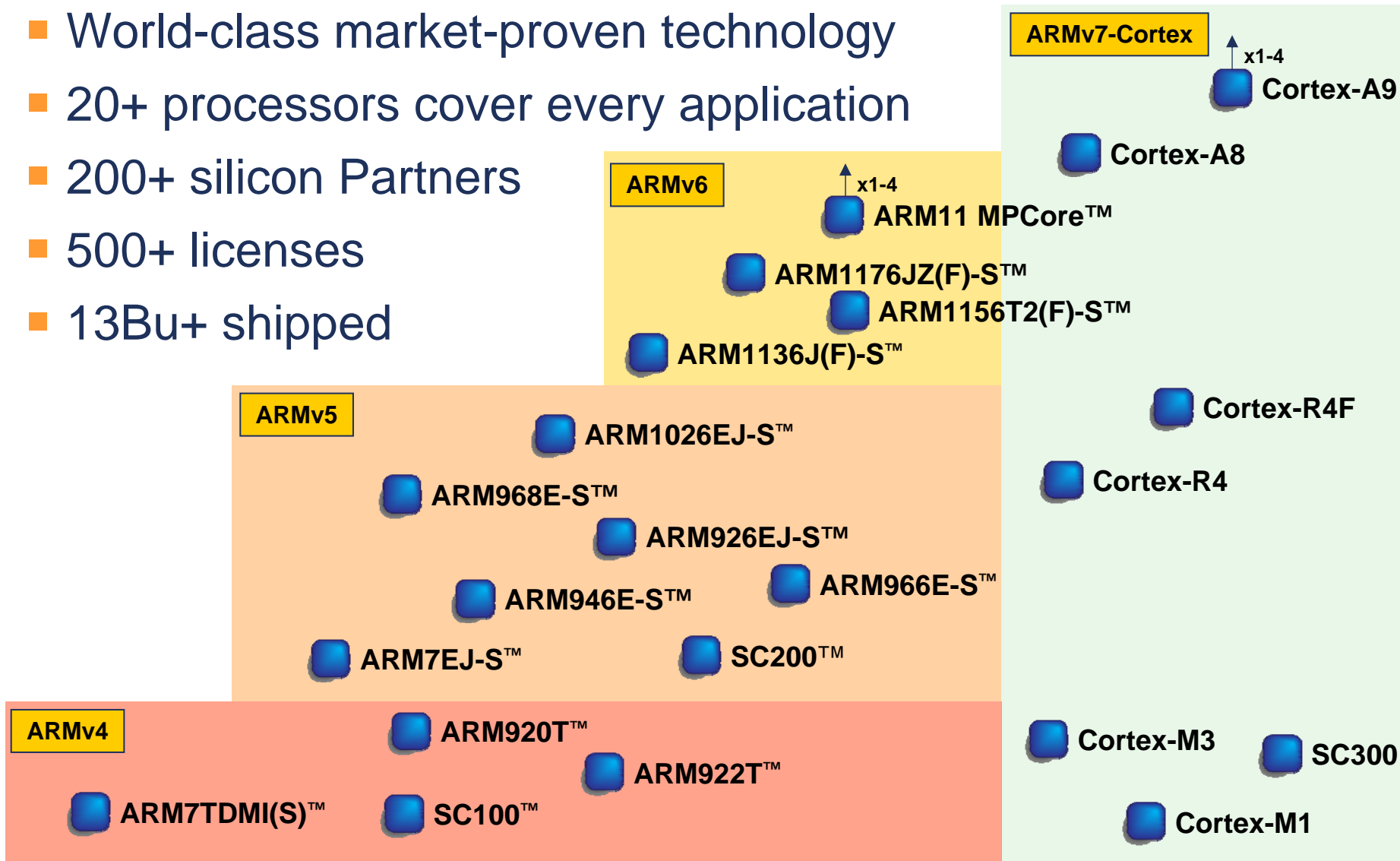
Bringing the benefits of architectural innovation across the spectrum

- **ARM Cortex-A Series:**
 - Applications processors for complex OS and user applications
- **ARM Cortex-R Series:**
 - Embedded processors for real-time signal processing and control applications
- **ARM Cortex-M Series:**
 - Deeply embedded processors optimized for microcontroller and low-power applications



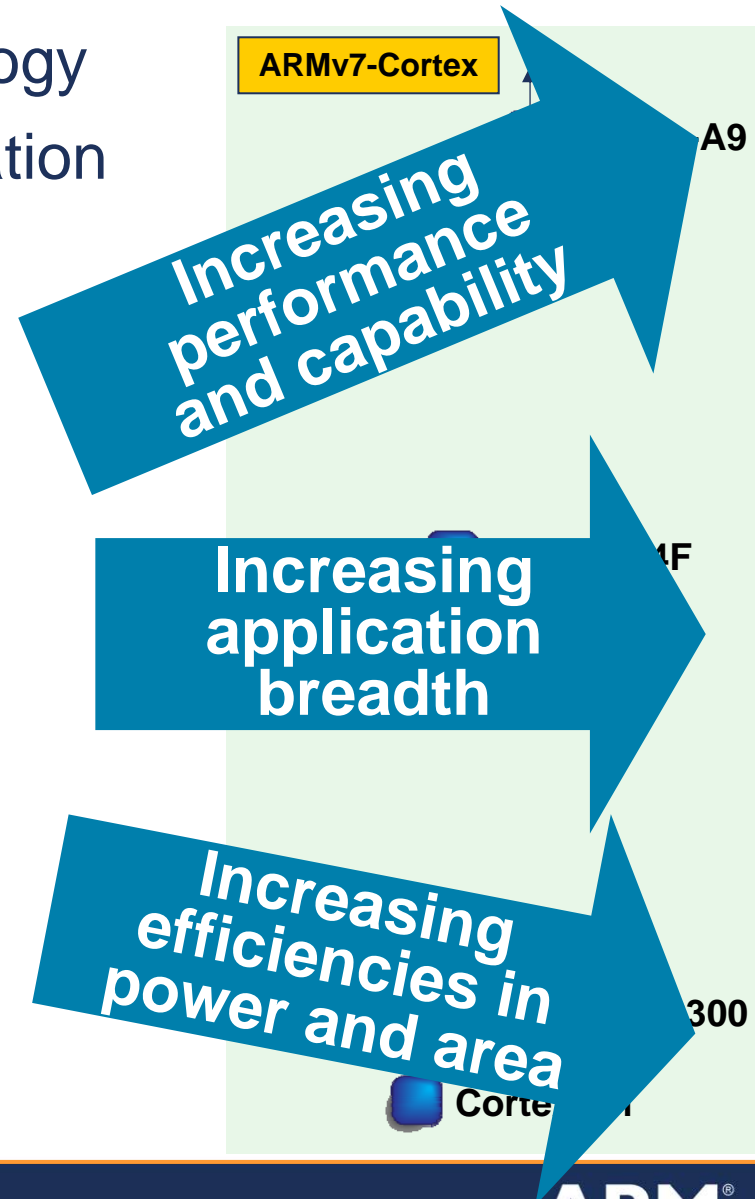
ARM Processor Portfolio

- World-class market-proven technology
- 20+ processors cover every application
- 200+ silicon Partners
- 500+ licenses
- 13Bu+ shipped



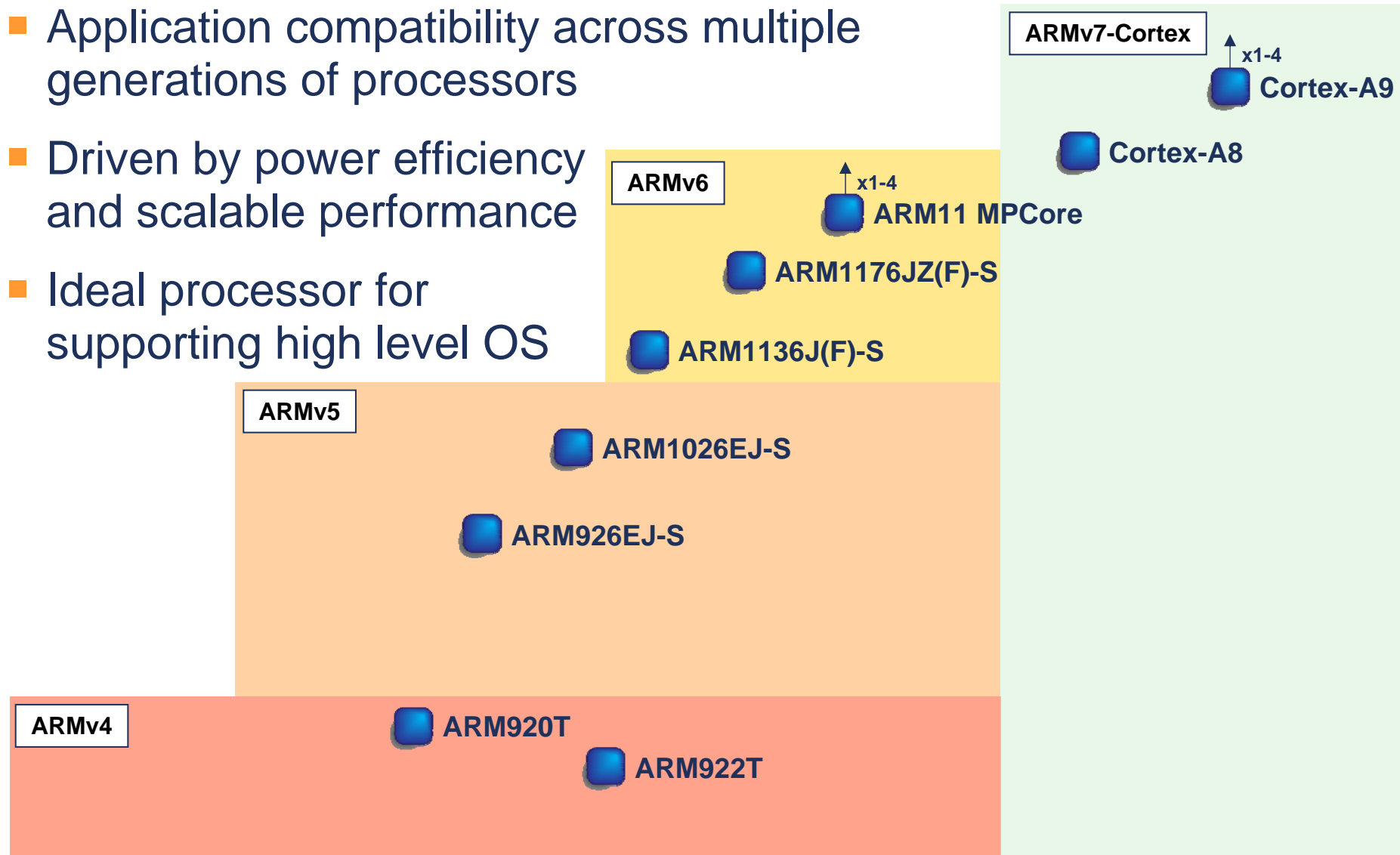
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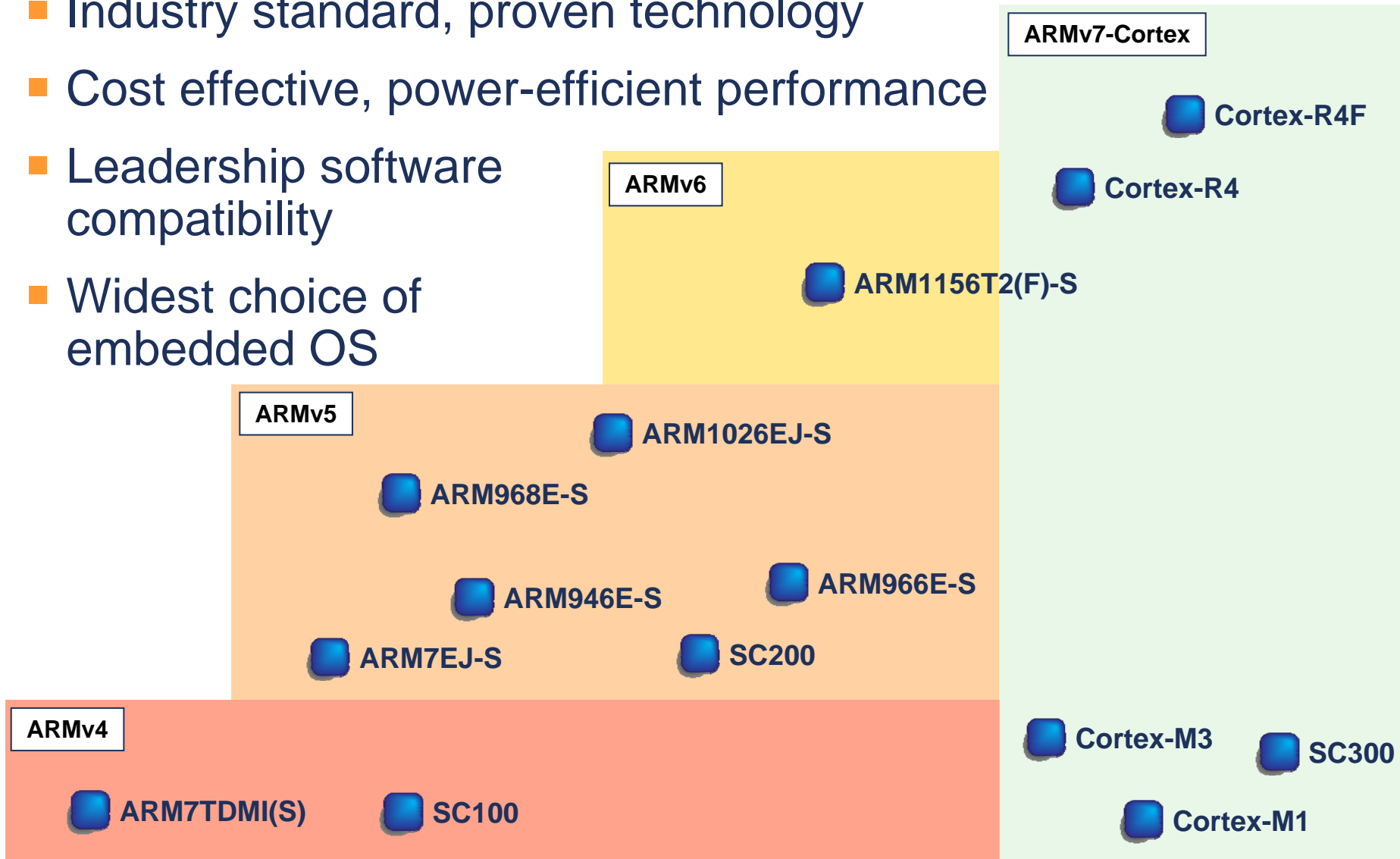
Applications Processor Roadmap

- Application compatibility across multiple generations of processors
- Driven by power efficiency and scalable performance
- Ideal processor for supporting high level OS

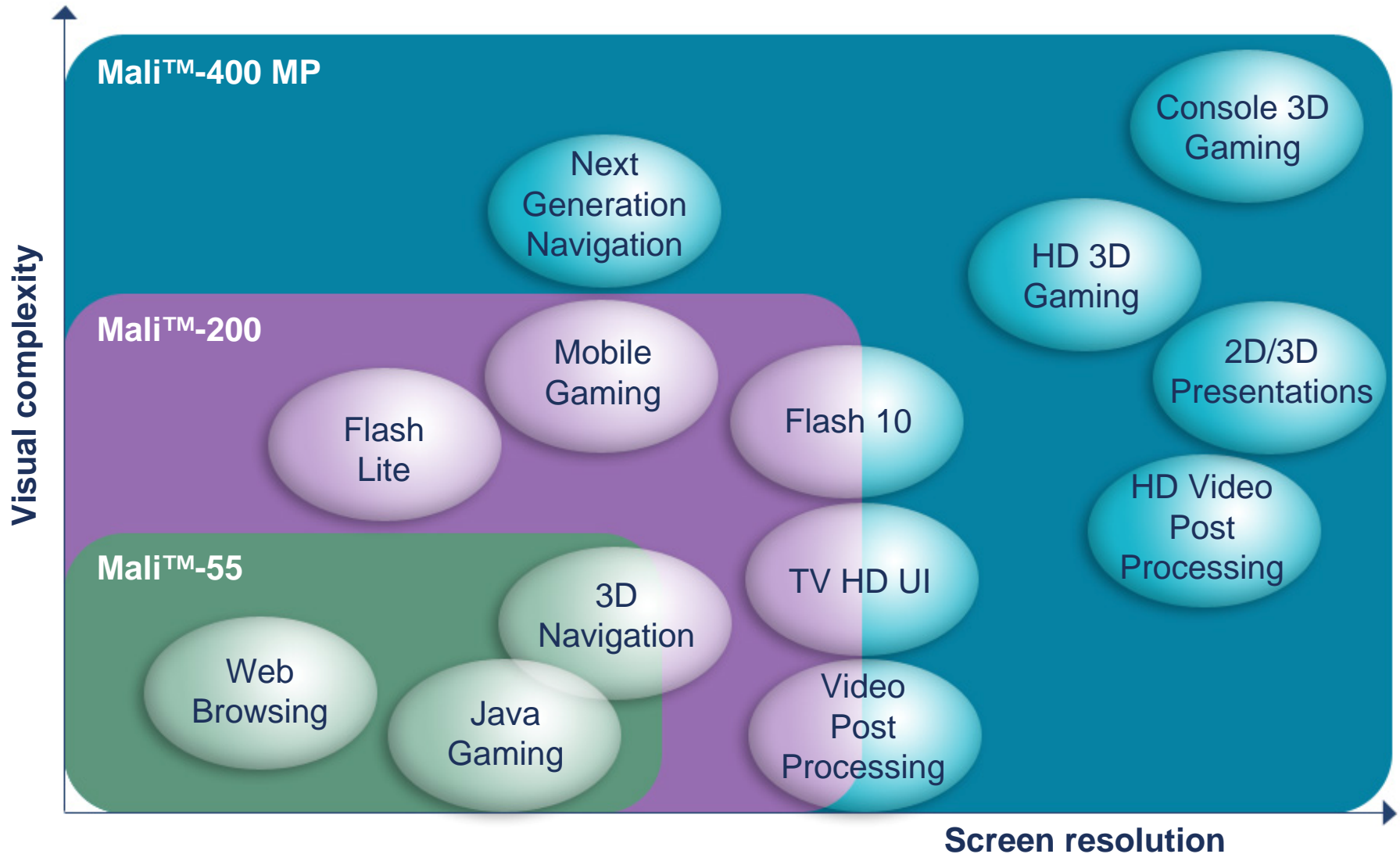


Embedded Processor Roadmap

- Industry standard, proven technology
- Cost effective, power-efficient performance
- Leadership software compatibility
- Widest choice of embedded OS



GPU - Performance Scalable to 1G Pixel/s



Bringing Graphics to the Mainstream

Wireless



Automotive



Home



15 Mali GPU Licensees

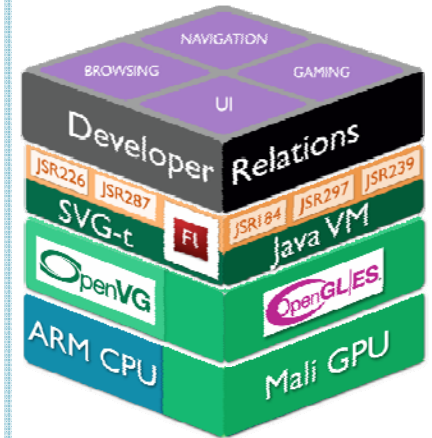


public licensees of Mali GPU

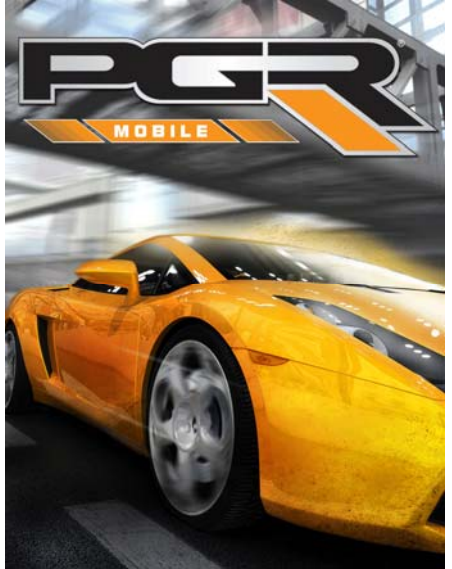
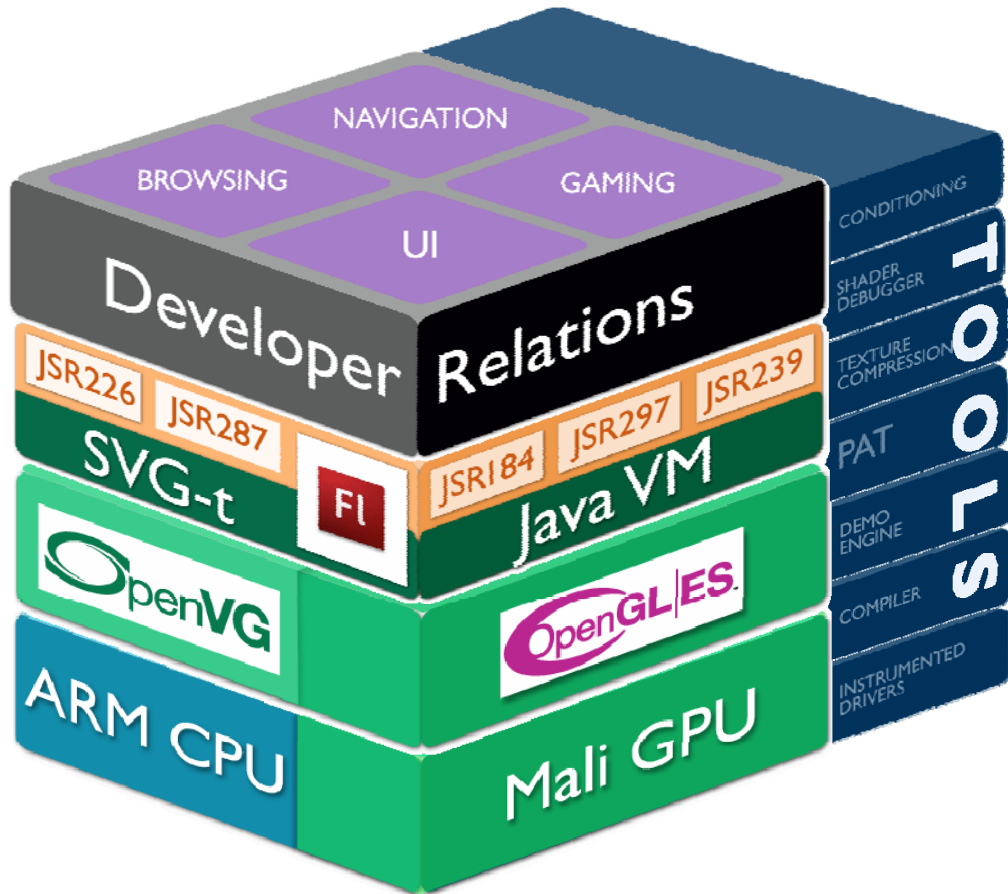
Over 150 devices now shipping from OEM graphics partners



Mali is the "Complete Graphics Stack"



Partnership: Mali and Developers



ARM is at the Heart of Low Power



- World's 2.3Bn mobile phones can be kept charged with 100 Mega-Watts
 - Equivalent to 2 large wind-farms

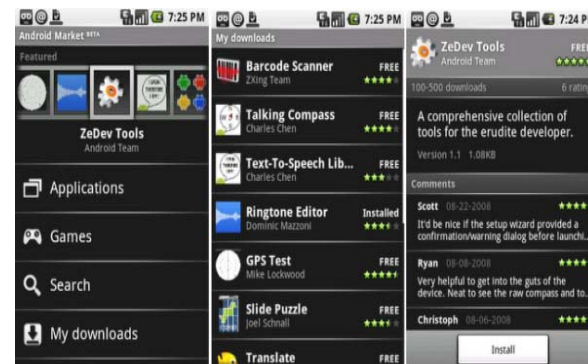


- World's 1Bn PCs are on for 9 hours* per day requiring 95,000 Mega-Watts
 - Equivalent to 114 large coal-fired (835MW) power plants

* US PCs are on for 9.2 hours per day - www.itfacts.biz

Web 2.0

G1 - Oct 2008



Android Market



ARM11 Powered – Web 2.0 centric phone

Partnership: Full Web 2.0 Experience

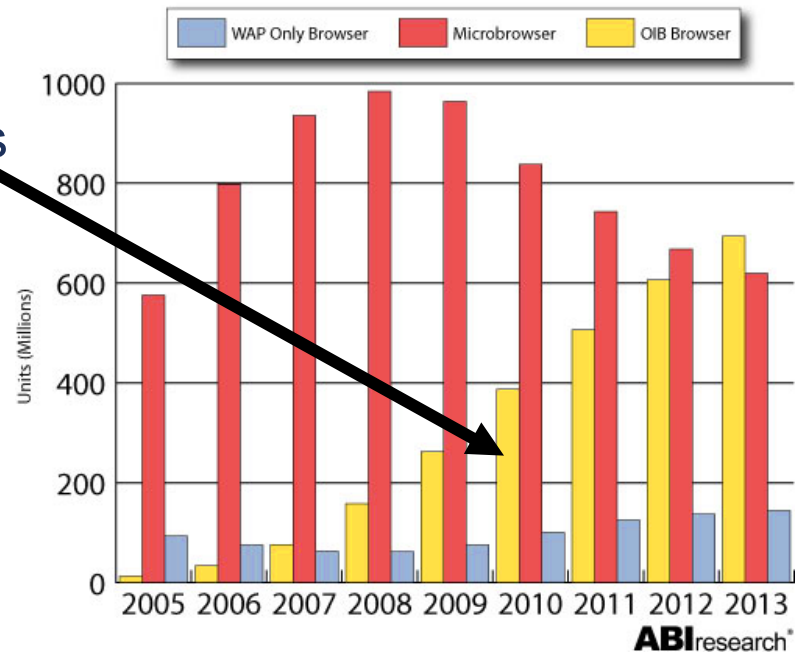
- Adobe Open Screen Project, parity with the PC
- Google Chrome launched on PC and ARM simultaneously
- Silverlight on Windows Mobile, S40/S60 devices only with ARM
- Optimized Windows Media codecs for ARM from Microsoft
- Up to 6X better JavaScript benchmark performance in latest Mobile Firefox
- NEON-optimized video codecs from multiple partners



Mobile Internet Redefines The Web

- By 2010 about 400 Million internet enabled mobile devices will ship
 - More than notebooks and desktops combined
 - Enabled by integration, platform and software
- Mobile Internet investments will redefine Consumer Electronics
 - Hardware, software and support will be reused across all consumer electronics

Total Browsers Shipped by Type
World Market, Forecast: 2005 to 2013



ARM is Excellent for Browsing Today

- Web is not just for mobile devices
- Web delivers complex presentation layer
 - CSS, Java, AJAX, Flash, Video, Audio
- Driving Consumer Electronics innovation



- 500MHz+ ARM11 mainstream
 - Today's excellent mobile experience
- Cortex-A8 now best choice for Adobe Flash, Microsoft Silverlight
- Cortex-A9 next; future roadmap continues leadership

Full Ubuntu Desktop on ARMv7

- ARM and Canonical partnering to deliver the Ubuntu desktop distribution for ARMv7 in April 2009
- Desktop edition features support for
 - Full OpenOffice suite
 - Multiple browsers
 - Large set of additional applications e.g. instant messaging, multimedia
- Canonical will provide optimized SoC and OEM supported distributions for the ARMv7 architecture

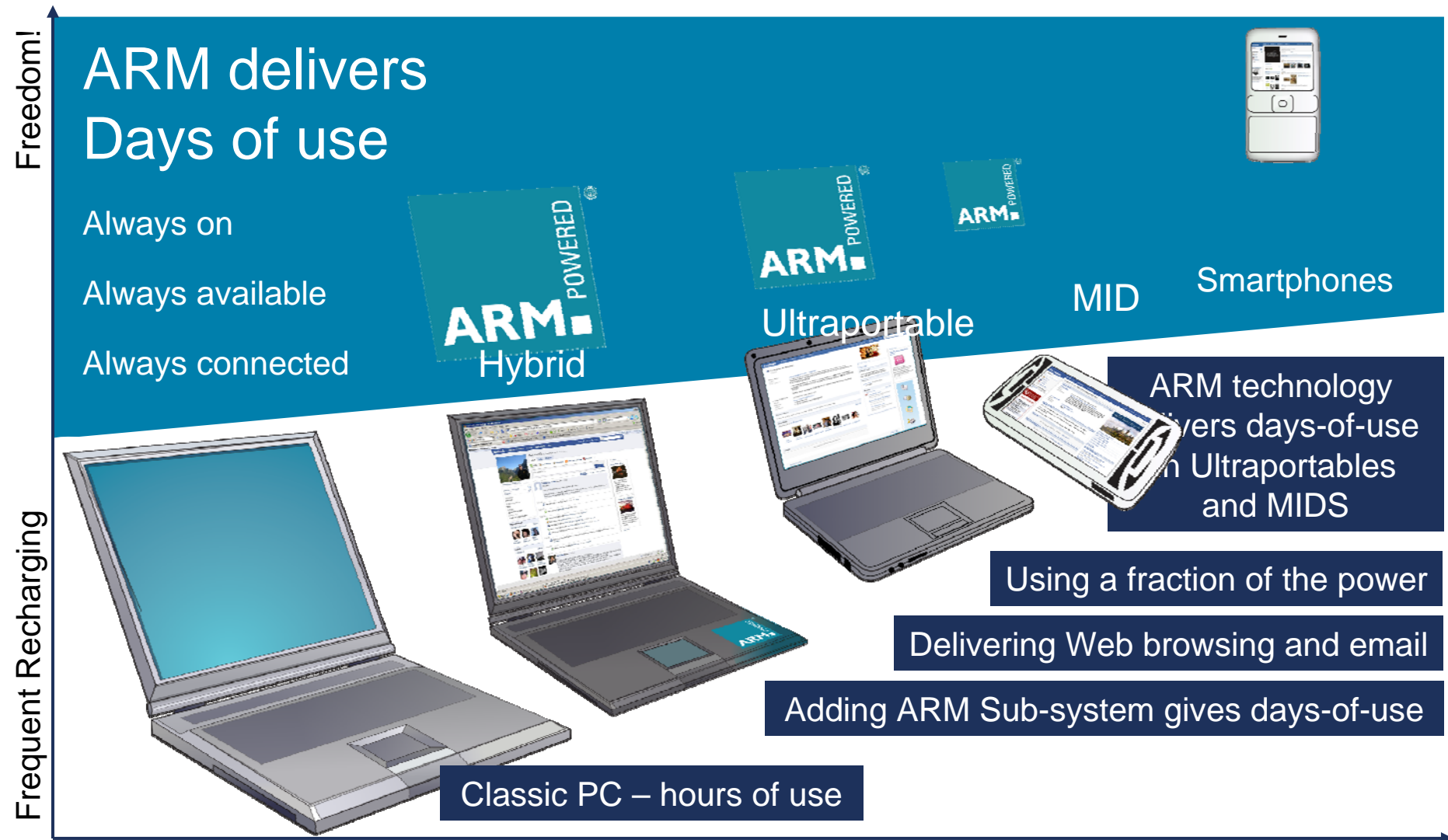


Flash Player 10 and AIR for ARM

- Adobe and ARM collaborating to bring a full, low power optimized version of Flash Player 10 to the ARM Architecture
 - Optimizations target ARMv6 and ARMv7 processors, 2H 2009
 - Taking advantage of video and graphics processors such as the ARM Mali GPU family via open standards
- This is not just about mobile phones
 - Over 1 billion ARM architecture-based processors ship a quarter
 - DTVs, STBs, DSCs, MIDs, Gaming, Car infotainment etc
- This is not just about a browser plug-in
 - AIR for Rich Internet Applications
 - Flash Player 10 for widgets and UIs



Opportunity: Untethered Mobility



MCU

Opportunities and Trends in Embedded

*ARM estimates

| TAM Units (M) | 2007 | 2007 ARM cores* | 2012* |
|--------------------|------|-----------------|-------|
| Automotive | 1170 | 80 | 1800 |
| Smartcard (32 bit) | 275 | 120 | 670 |
| MCU (32-bit) | 800 | 135 | 2500 |
| MCU (8/16-bit) | 4300 | n/a | 4000 |

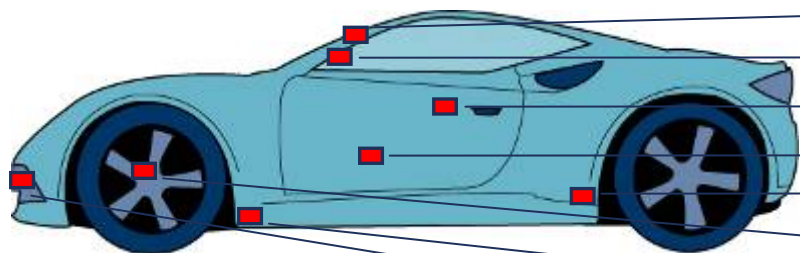


Key trends

- Single architecture for software reuse
- Falling LCD prices and low-power graphics processors driving adoption of virtual dashboard
- Increasing software development costs drive migration to 32-bit for easier development and software reuse
- Low power a key success driver in MCU
- 32-bit Smartcards increase real estate available to network operators on phones

Next generation automotive potential

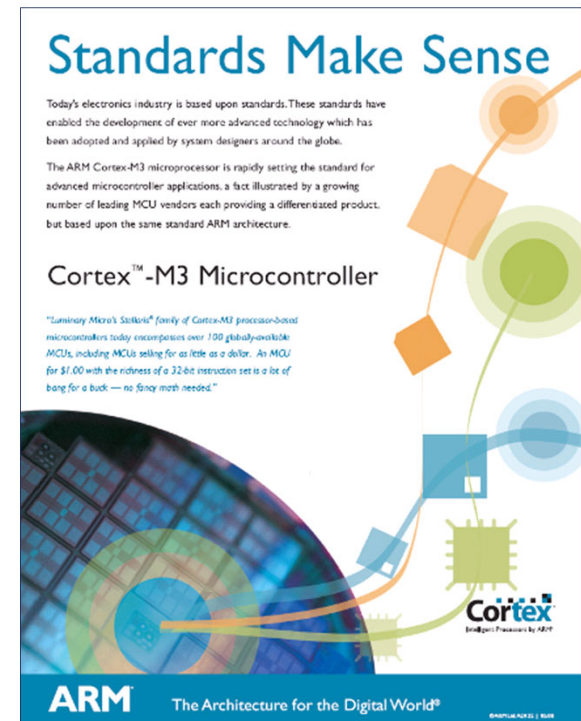
- Multiple application processors
- 2D/3D graphics: infotainment, navigation, display
- Connectivity (UWB/Bluetooth) controller
- Body controllers
- Powertrain controllers
- Chassis controllers
- Physical IP
- Driver Assist
- ...



Source: Gartner, Strategy Analytics, IMS, Semico and ARM estimates

Developing Growth in Embedded

- Vision: ARM-based MCUs become the standard
- The best devices and infrastructure
 - Cortex-M3 processor latest release extends reach via even greater energy efficiency
 - ARM Microcontroller Development Kit ~380 ARM-based devices supported, 3.5x increase in 2 years
- The best choice for developers
 - Offering the broadest choice through industry partnership
 - Choice needs standards to reduce software complexity



Standards Make Sense

Today's electronics industry is based upon standards. These standards have enabled the development of ever more advanced technology which has been adopted and applied by system designers around the globe.

The ARM Cortex-M3 microprocessor is rapidly setting the standard for advanced microcontroller applications, a fact illustrated by a growing number of leading MCU vendors each providing a differentiated product, but based upon the same standard ARM architecture.

Cortex™-M3 Microcontroller

"Luminary Micro's Sitlkin® family of Cortex-M3 processor-based microcontrollers today encompasses over 100 globally-available MCUs, including MCUs selling for as little as a dollar. An MCU for \$1.00 with the richness of a 32-bit instruction set is a lot of bang for a buck — no fancy math needed."

ARM The Architecture for the Digital World®

Cortex
Embedded Processors by ARM

Standards Make Sense

- Problem: Well-known challenges drive software costs
 - Increasing product requirements implemented through software
 - Reuse of software components has been historically low

Cortex Microcontroller Software Interface Standard (CMSIS)

enables deployment of software components
to physical microcontroller devices

- Reduces software complexity and increases reuse
- Provides industry-wide programming standards
- Supports partnerships and innovation

Partnership Driving CMSIS

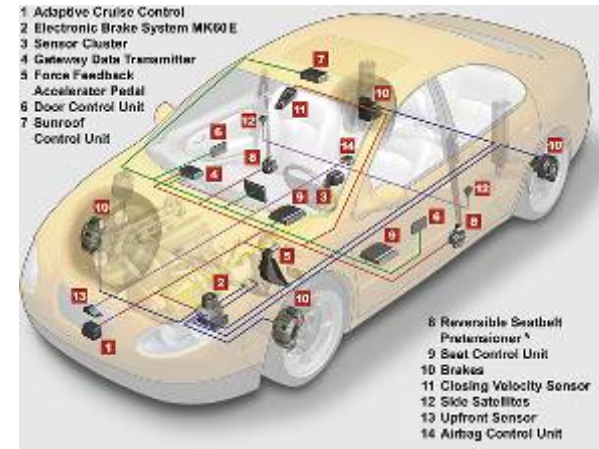
- Silicon Partners
 - Atmel
 - Luminary
 - NXP
 - STMicroelectronics
- Software Partners
 - IAR Systems
 - KEIL, an ARM Company
 - Micrium
 - SEGGER
- Open Source Community (GCC)



ARM in Technology that Sells Cars

■ Safety and Driver Assistance

- ARM in over 65% of EBS and 40% of airbag
- Fault Robust technology enabled
- Integration with modeling tools for Driver Assistance and Active/Passive Safety Integration

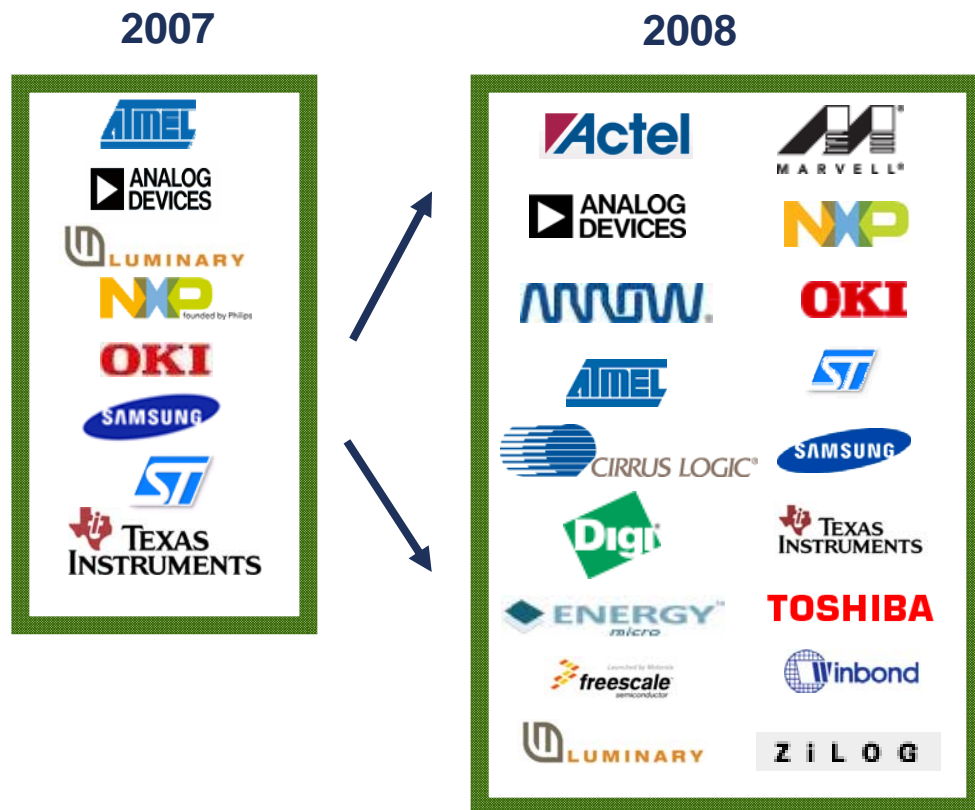


■ Navigation and Car Multimedia

- Convergence with PND market
- Driver Information: LCD prices driving adoption of virtual dashboard
- ARM Ecosystem enables strategic platforms opportunities such as Ford + Microsoft Sync



Driving Growth in Microcontrollers



- ARM increasingly adopted as the standard 32-bit MCU architecture
- Over 20 vendors offer ARM based MCUs
- Winbond and Zilog recently adopted ARM
- Arrow licenses Cortex-M3 to develop their own silicon
- More MCU announcements expected in H2 2008

Cool Products



BlackBerry Bold

Marvell "Tavor" PXA930

ARM Architecture Based – Xscale processor



Innovations for learning - TeacherMate

ARM9 Processor



D-Link DNS323 Network Storage Enclosure

Marvell 88F5181 Soc – ARM9 processor



Sonosite MTurbo (Portable Ultrasound Device)

Texas Instruments TMS320DM644x - ARM926 Processor



iRiver Unit 2 Multimedia Home Networking device

Telechips and Samsung – ARM9E + ARM11 Processors



Samsung SMT-H30560 Cable STB

Conexant CX2417X – ARM920T Processor



Embedded Automation – mPanel (Digital Home Device)

ARM architecture-based – Marvel XScale



Sunlink International - SunView PMP + Projector

Samsung S3C244A – ARM9 Processor



Garmin Nuvi 205
ST Cartesio Processor - ARM926



Everex Cloudbook UMPC
GCT Semiconductor – ARM9 Processor



Importek Apollo VoIP Video Phone
ARM9 + Marvell Xscale processor



Thomson WiFi Tablet
TI DaVinci TMS320DM6441 – ARM926EJ-S



Artega - Artega GT (Dual-Dashboard Display)
Fujitsu MB86R01 "Jade" graphics controller
ARM926EJ-s + Jazelle Java Acceleration Technology



VivoPay – Vivo Kiosk
ARM Powered



iRiver NV Life PMP
Magic Eyes - ARM926EJ +
ARM946E



Custom Engineering - TK300II Desktop Ticket Printer
ARM Processor (266MHz)