MIPS Technologies
Powering a Connected World

June 2010

Greater China Update

Ying-wai Ho

General Manager, MIPS Shanghai

Greater China Opportunity

Rapid adoption of MIPS architecture and cores; rapid adoption of Android
Over 35 customers in Greater China
MIPS in almost every major IC company in Taiwan

Mobile opportunity! APAC customers/prospects showing great interest in MIPS for mobile
MIPS' high performance/low power advantages
& potential to differentiate

Winning majority of designs for next-generation set-top boxes—satellite plus terrestrial and cable
Customers innovating in STBs with MIPS

Shenzhen IC Design Industrial Center

At the core of the user experience.®

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MIPS-Shanghai Development Center

Dedicated Shanghai-based MIPS design & engineering center—hardware & software
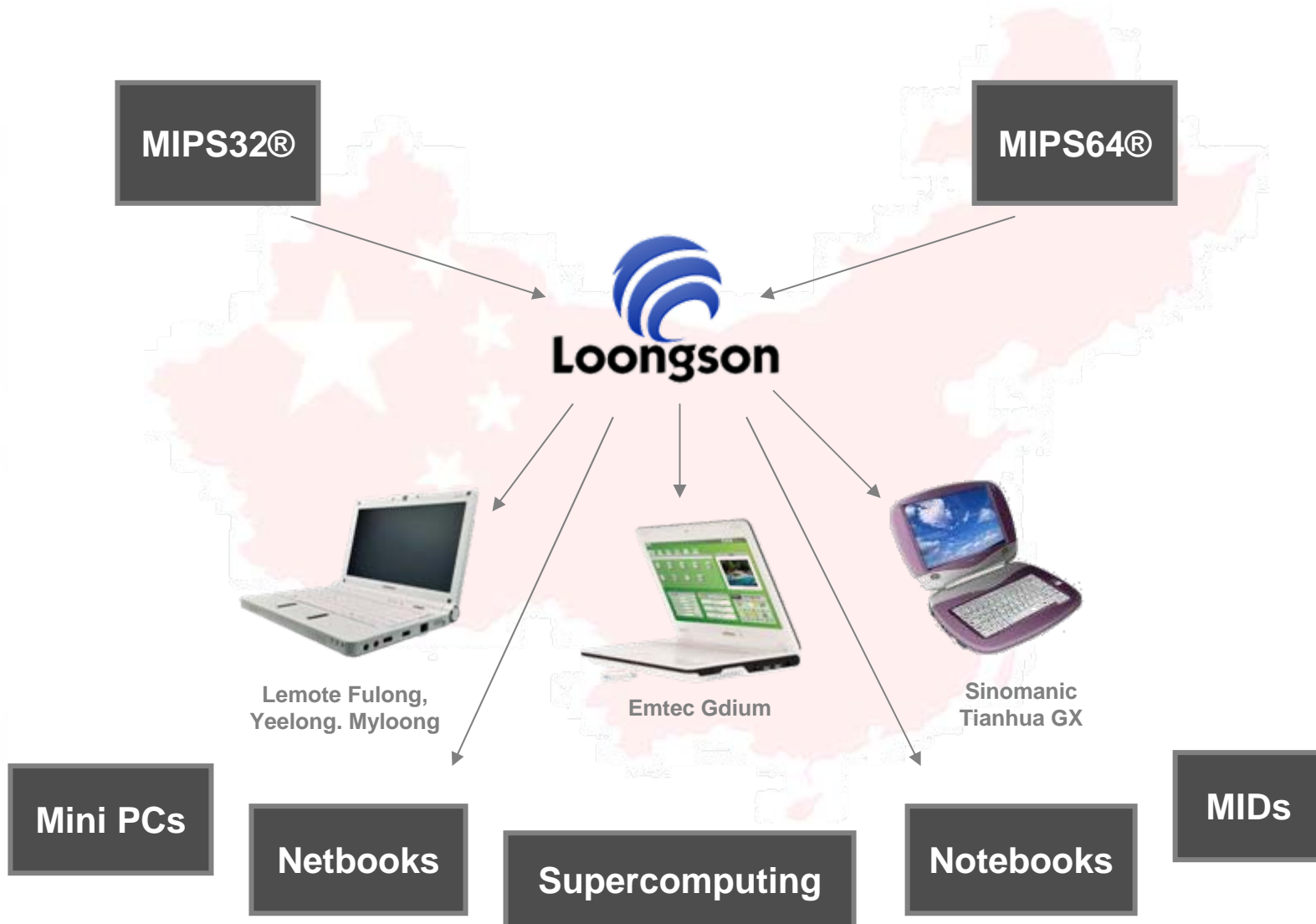Only leading processor company developing cores in China

New M14K and M14Kc soft cores based on microMIPS ISA designed and developed entirely in China

Expanding Shanghai engineering team
Leveraging China talent and cost structure
Future plans for expanding operations in China to take on more engineering projects

China Engineering Center

Proliferating MIPS in China: ICT Partnership

MIPS32®

MIPS64®

Loongson

Lemote Fulong, Yeelong. Myloong

Emtec Gdium

Sinomanic Tianhua GX

Mini PCs

Netbooks

Supercomputing

Notebooks

MIDs

MIPS in Greater China

Aggressively developing mobile ecosystem
Working closely with new flagship mobile customer

Android is key technology
Almost all digital consumer/mobile licensees have
investigation/development projects in progress

**Exploding interest among APAC customers
in new platforms for mobile and
advanced consumer electronic devices**

Introducing

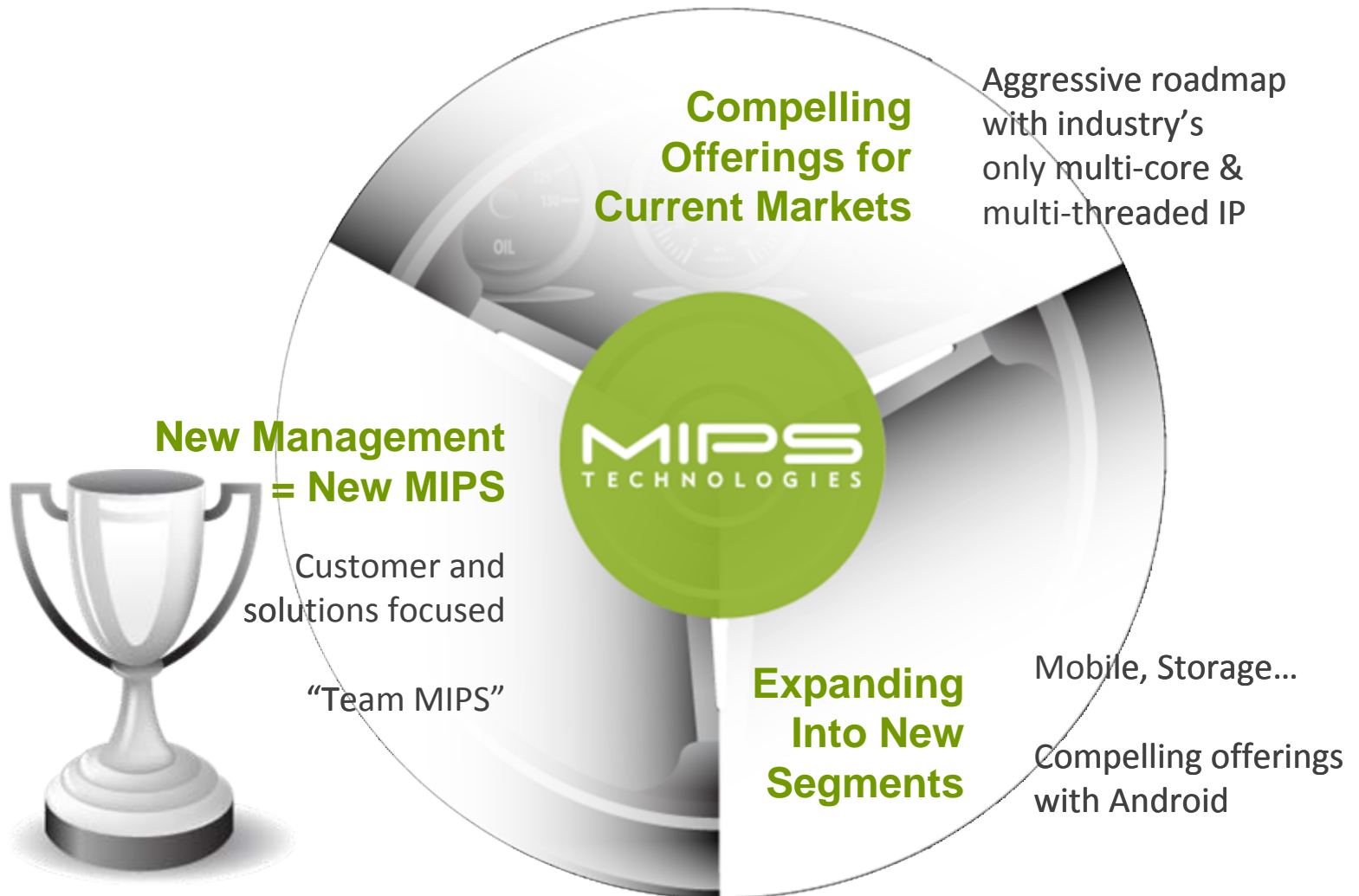费浙平 **Felix Fei**
Marketing Director, MIPS China

Corporate Update

Art Swift

Vice President of Marketing

Success Drivers

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Compelling Offerings for Current Markets

Aggressive roadmap with industry's only multi-core & multi-threaded IP

New Management = New MIPS

Customer and solutions focused

"Team MIPS"

Expanding Into New Segments

Mobile, Storage…

Compelling offerings with Android

Industry's Most
Scalable Processor Architecture

MIPS
TECHNOLOGIES

32-bit
Microcontrollers

64-bit Chips for
Advanced Networking

And everything in between

Number One in Digital Home CPUs

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Number One Market Share

Digital TV

**Cable, Satellite &
IPTV Set-top Boxes**

Blu-ray Disc Players

DVD; DVR

Digital Cameras

Broadband CPE

**WiFi Access Points
and Routers**

*IDC Research, 2008 embedded
processor share

Networking Applications Leadership: Outpacing the Competition

Wired+Wireless Networking Equipment

Source: IDC 2009
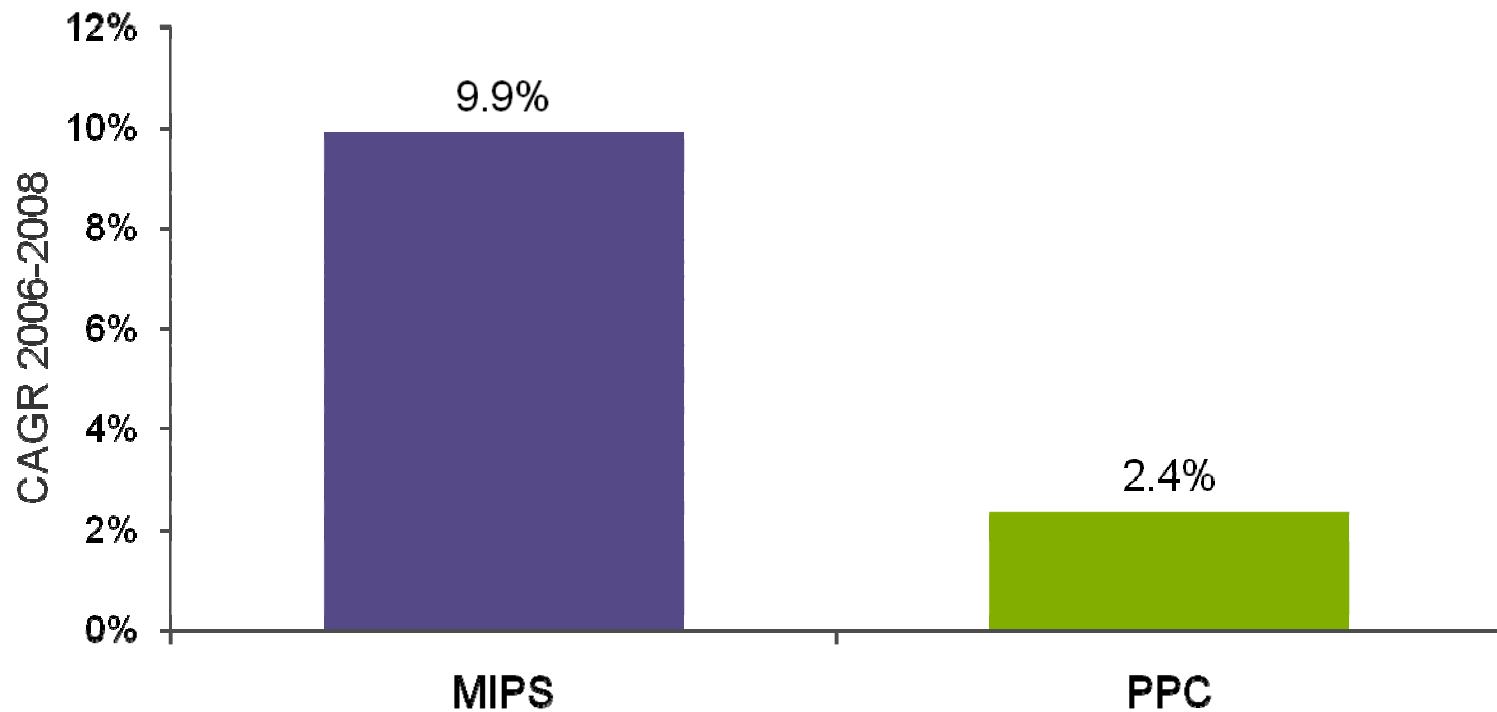
Storage Controllers: A Growth Market

HP Smart Array
P410 controller

"PMC's growth and revenue upside was largely driven by storage, which set a new revenue record and doubled vs. Q1 levels…"

–January 29, 2010

"PMC should continue to benefit from a number of identifiable drivers in its storage business in 2010. A full year of revenue from the HP RAID-on-chip win should provide an incremental $35M in revenue vs. 2009."

– March 25, 2020

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At the core of the user experience.®

Microchip—number 1 MCU provider
32-bit PIC32 MCUs based on
MIPS32 M4K core

**Performance and power efficiency
leadership; large ecosystem of support**

**Proliferating MIPS architecture to
huge community of developers**

POWERTRAIN

BODY

SAFETY

CHASSIS
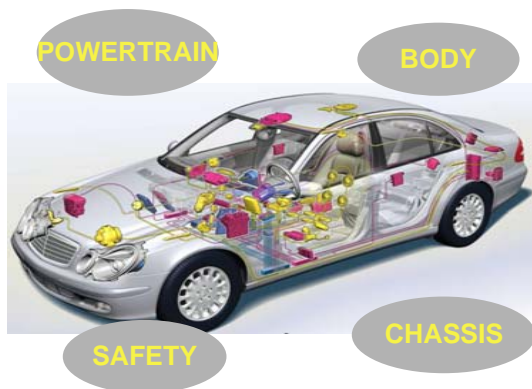
MIPS for Automotive

Infotainment
Driver Assistance
Instrumentation
Navigation
Safety
Mobile Telephony

Mobile: High Volume Growth Opportunity

Mobile handsets: New flagship customer in APAC developing 3G & 4G mobile applications processor with MIPS!

Portable automotive: new design wins for for driver safety assistance and in-car entertainment
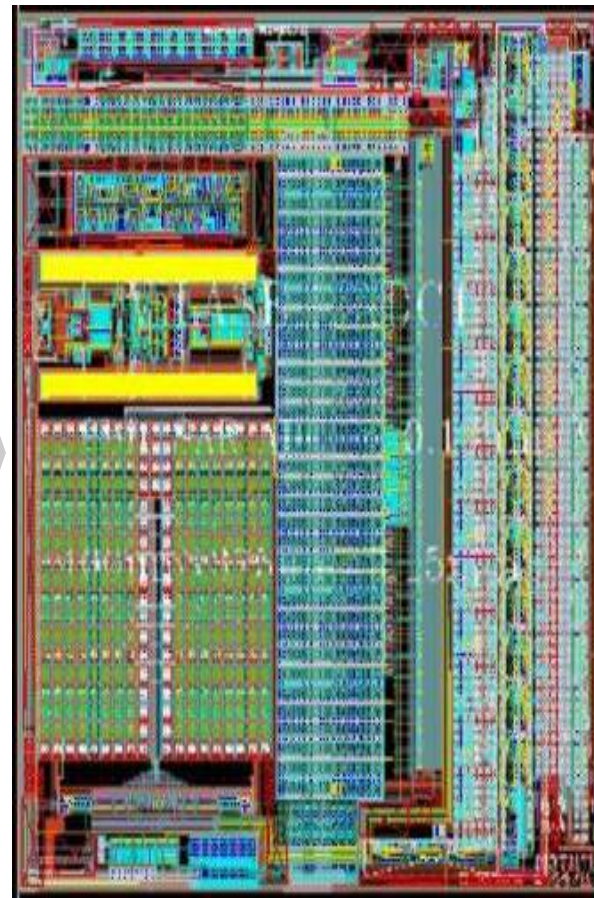
Continued traction in MIDs and other portable devices—new SiS win

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# Teaming with Complementary IP Providers to Accelerate SoC Development

Providers	Category
Imagination TECHNOLOGIES / DMP / VIVANTE	**Graphics**
Discretix embedding security solutions	**Security**
tensilica	**HiFi Audio**
web▶m developer preview / Chips&Media Global Leading Video IP Provider	**Video**
VIRAGE LOGIC	**Memories**

Helping SoC developers get to market quickly with fully-integrated hardware/ software solutions
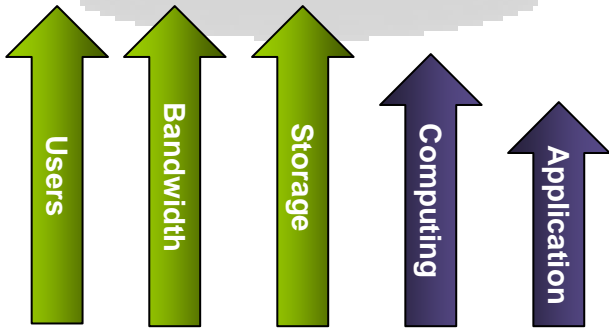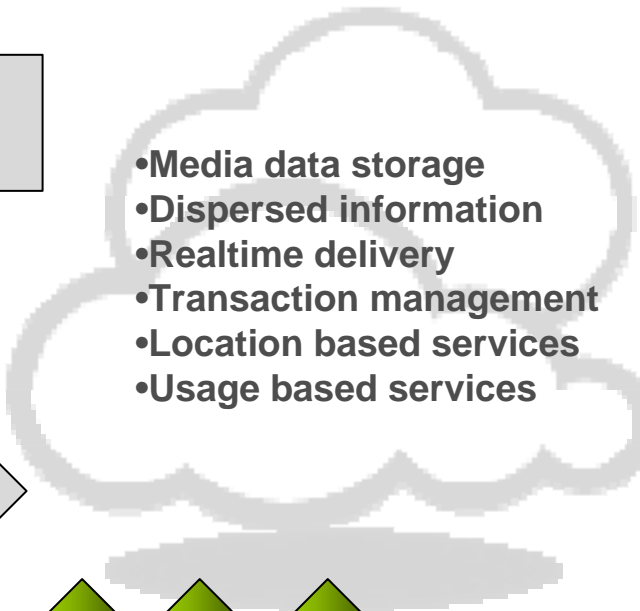
At the core of the user experience.®
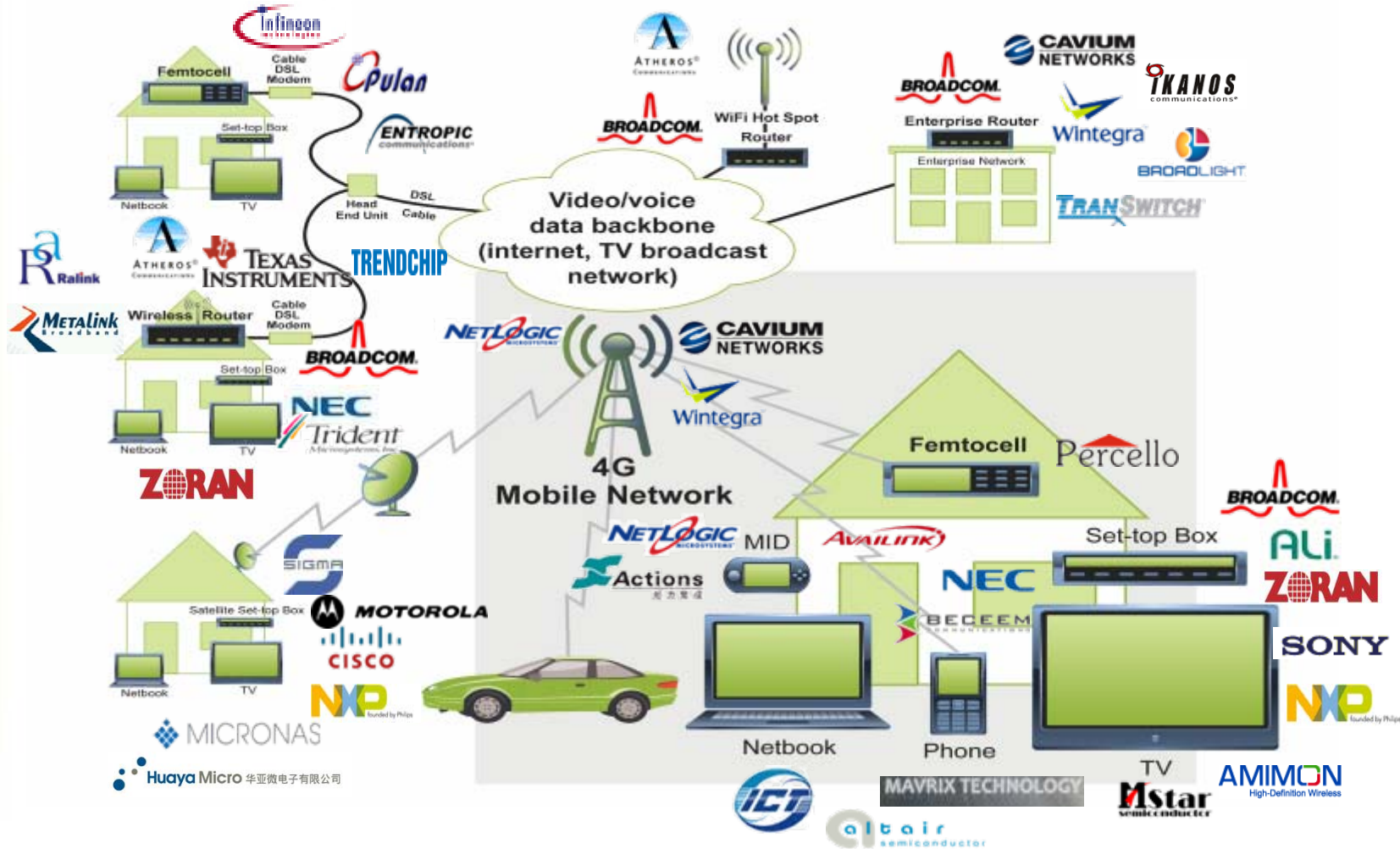
Cloud Computing Model for Digital Home
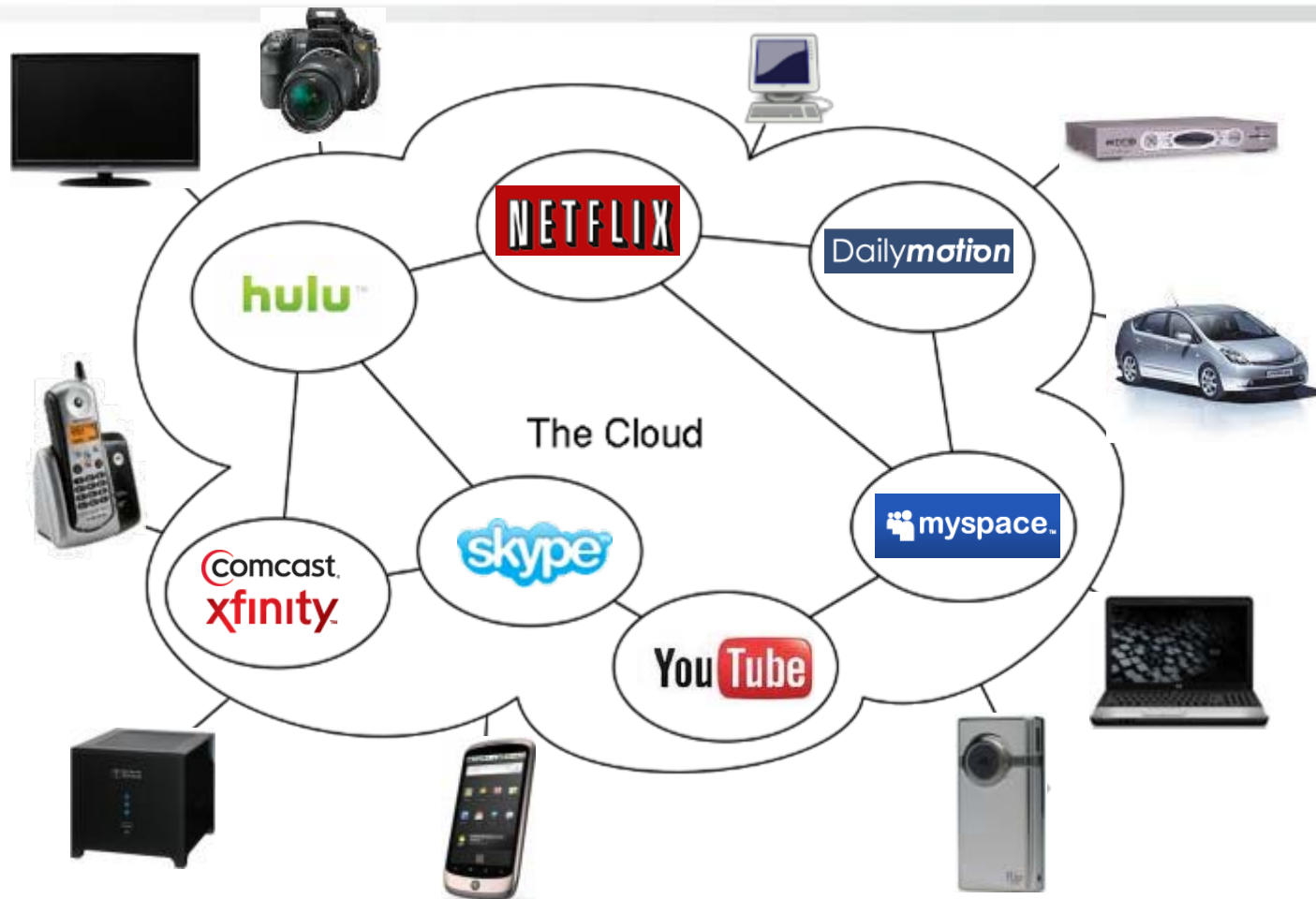
Content and entertainment centric applications

The Cloud as a Content and Entertainment Server

- Multimedia video stream
- Strict latency requirements
- Different display devices

- User generated content
- Usage tracking
- Pay services

- Media data storage
- Dispersed information
- Realtime delivery
- Transaction management
- Location based services
- Usage based services

Users | Bandwidth | Storage | Computing | Application
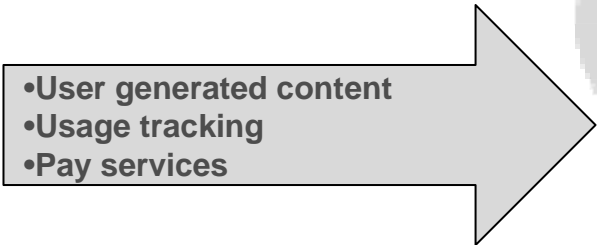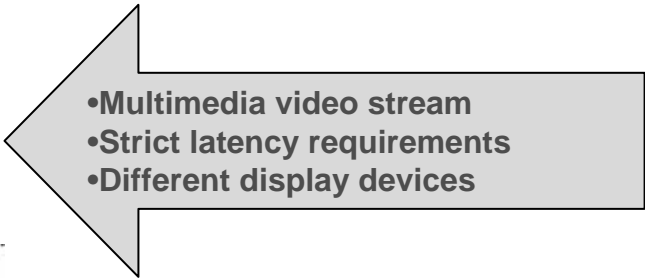
Cloud Computing Requirements

MIPS: Positioned to Win

Kevin Kitagawa

Director of Strategic Marketing

MIPS Goes Mobile!

100 mbps – 1GBps

**Android + 4G = opportunity for
MIPS to enter the mobile market**

**4G (LTE / WiMAX) protocols more similar to WiFi than 3G;
MIPS can directly leverage proven WiFi expertise**

**First MIPS-Based™ cell phones
to hit the market—2011**

Processor Independence

MIPS TECHNOLOGIES

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Previous phones were tied to ARM because of the OS

With Android, OEMs now have freedom to choose the best processor based on its merits!

Enabling Full Range of Mobile Technologies

Mobile Applications Processing

SiS • Actions 珠海炬力集成电路设计有限公司

MAVRIX TECHNOLOGY

ICT • NETLOGIC MICROSYSTEMS • altair semiconductor

New Flagship Customer!

3.5G Baseband/ Femtocell

INTRINSYC • Percello

4G Baseband: LTE and WiMAX

NETLOGIC MICROSYSTEMS • CAVIUM NETWORKS • 4M WIRELESS

SySDSoft • Continuous Computing

altair semiconductor • BECEEM

TATA ELXSI LIMITED • Wintegra • AMIMON High-Definition Wireless

Complementary IP and Enabling Technologies

Graphics — VIVANTE • Imagination • DMP

Video — Chips&Media Global Leading Video IP Provider • web•m developer preview

Audio — SRS • Fraunhofer INT • tensilica

VoIP — D2 • AudioCodes

UIs — KatOC INTERACTIVE • FST

Security — Discretix embedding security solutions • carbon design systems

SoC IP — SYNOPSYS • Virtual System Prototypes • denali • SONICS smart interconnects • VIRAGE LOGIC

Tools — CODESOURCERY • Green Hills SOFTWARE, INC. • VIOSOFT

Performance/Power Efficiency Leadership

At the core of the user experience.®

**More performance.
Best performance
per milliwatt.**

…to High End Multimedia Solutions

Coremark/mW

Double the performance at same power!

| ARM Cortex A9 Osprey (Power Opt) | MIPS32 1004Kf |

From Microcontrollers…
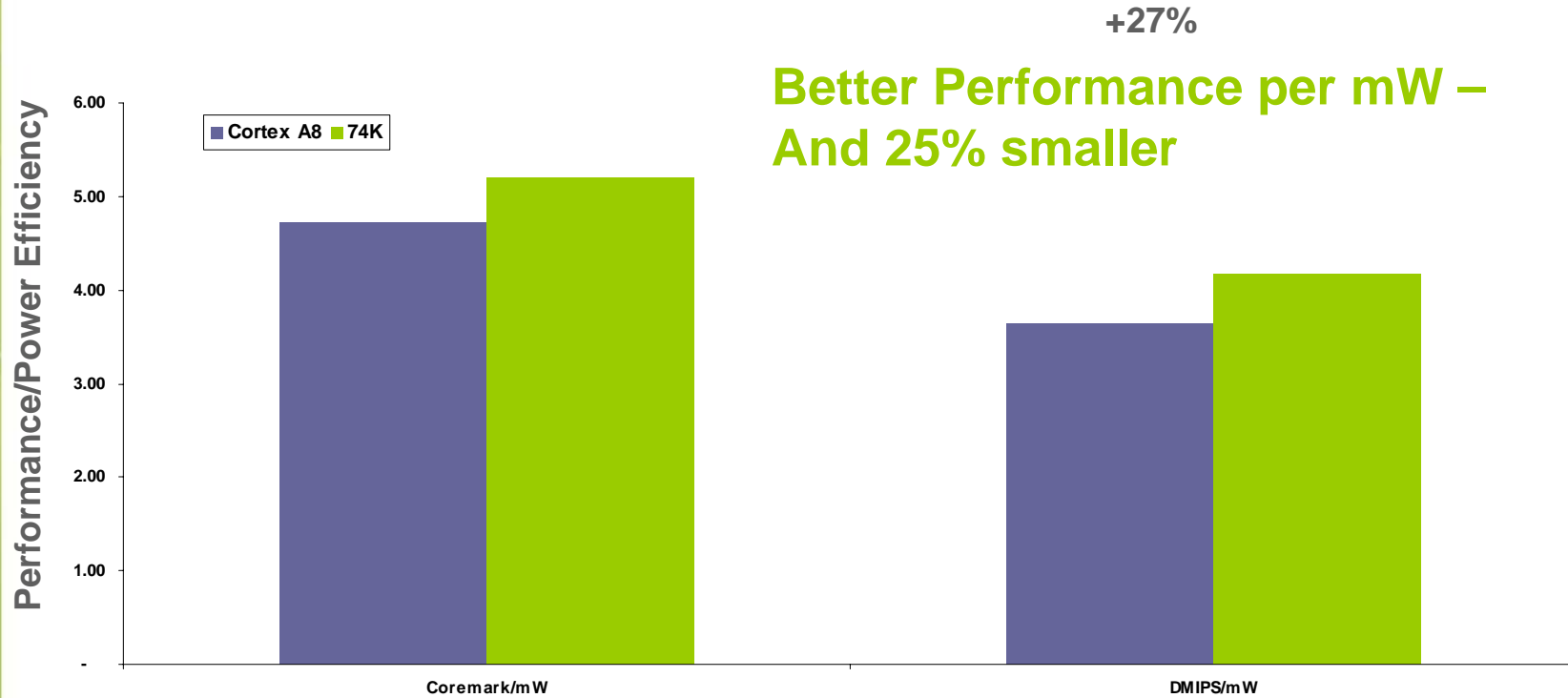
Coremark/mW

| ARM Cortex M3 | MIPS32 M14K |
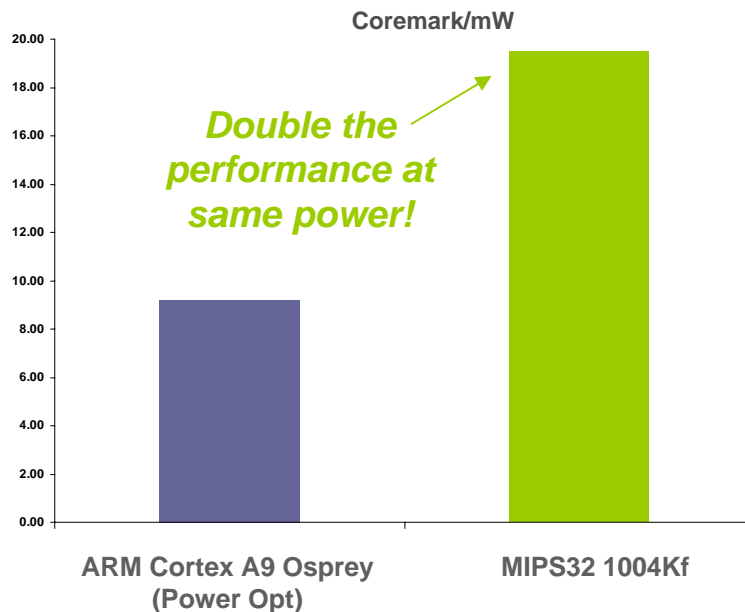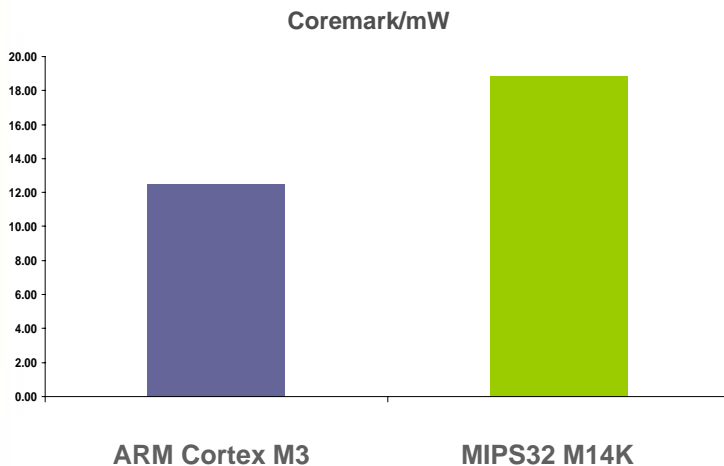
CoreMark, developed by EEMBC, is a simple yet sophisticated benchmark designed specifically to test the performance of a processor core.

74K Series Performance/Power Efficiency

Bigger is Better

+27%

Better Performance per mW – And 25% smaller

Bar chart: Performance/Power Efficiency (y-axis 0 to 6.00), comparing Cortex A8 and 74K for Coremark/mW and DMIPS/mW.

Worst Case SS Corner Frequencies, 10% OCV, 50ps clock jitter margins
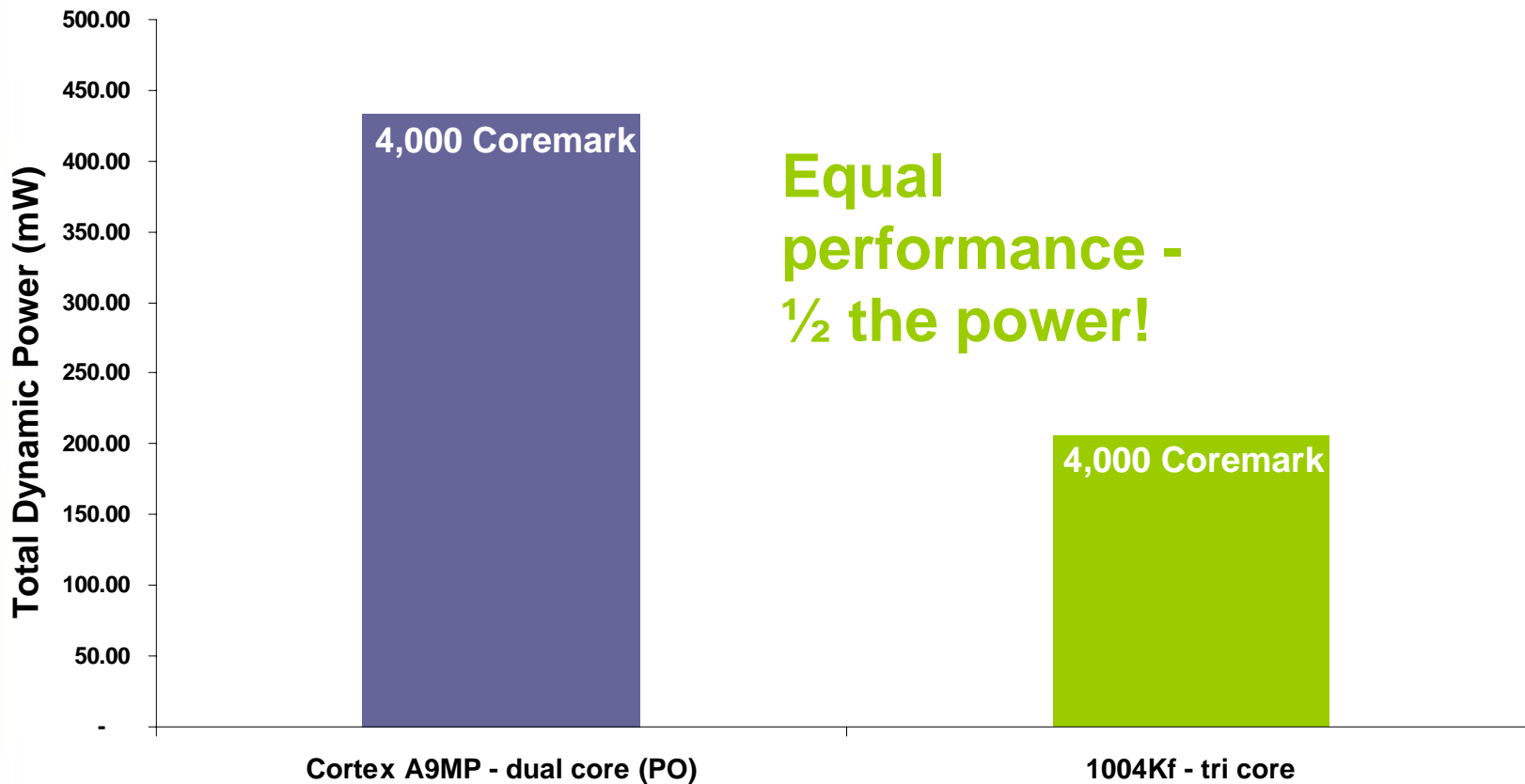
Power calculated running Dhrystone benchmark

ARM Cortex A8 data from available web data for synthesized implementations, such as:
http://www.jp.arm.com/event/pdf/forum2007/t1-5.pdf

Minimizing Power to Achieve 4,000 Coremark

Total Dynamic Power (mW)

| 500.00 |
| 450.00 |
| 400.00 |
| 350.00 |
| 300.00 |
| 250.00 |
| 200.00 |
| 150.00 |
| 100.00 |
50.00

4,000 Coremark

4,000 Coremark

Equal performance - ½ the power!

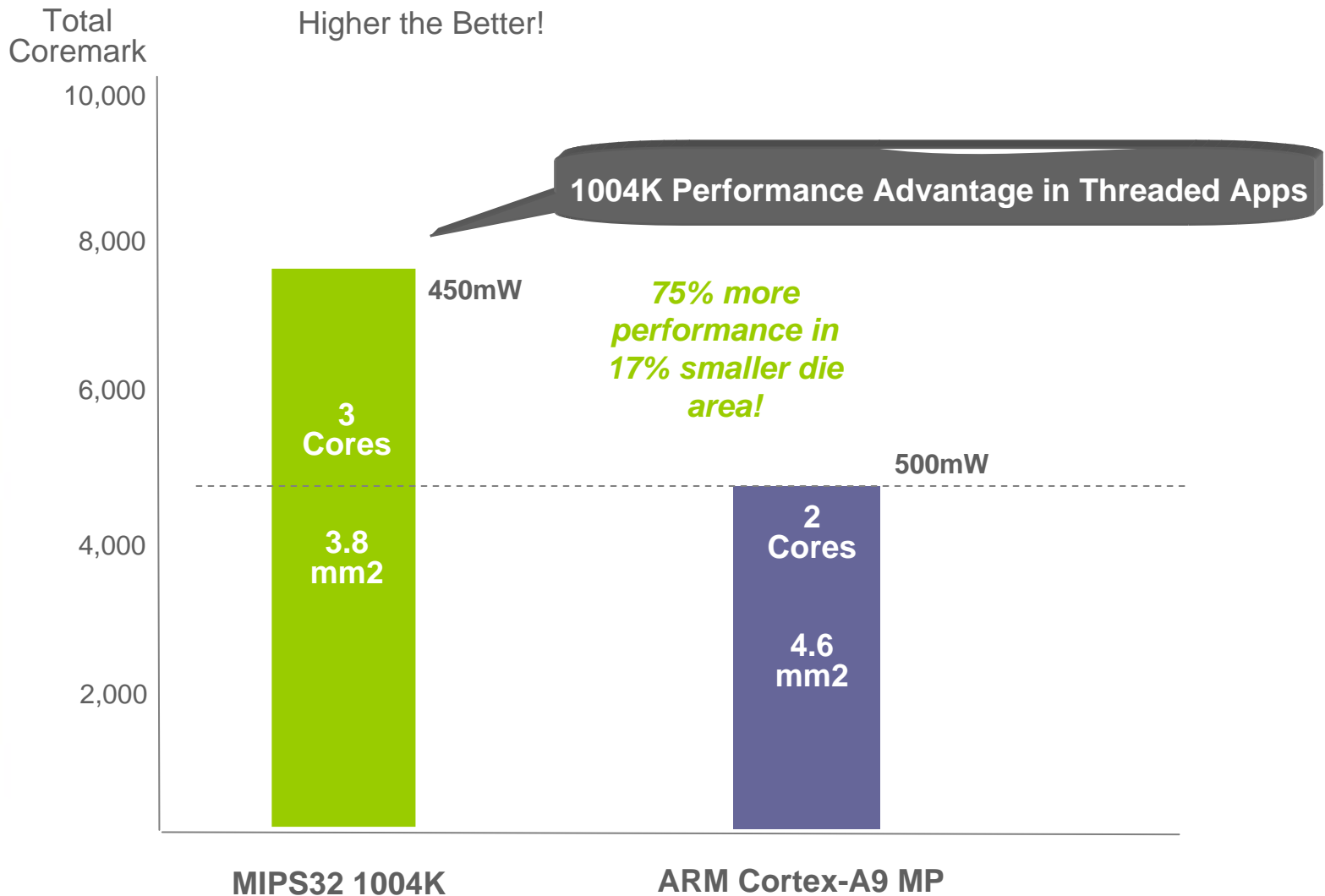Cortex A9MP - dual core (PO)   1004Kf - tri core

Based on scale down of data from ARM website for power-optimized dual core Cortex A9MP (TSMC 40G + ARM 12T standard cells) to achieve 4000 Coremark

1004Kf in TSMC40G with 9T standard cells, scale down of data from MIPS website to achieve 4000 Coremark

Power calculated running Dhrystone benchmark

Performance—MIPS versus ARM

Total Coremark

Higher the Better!

1004K Performance Advantage in Threaded Apps

450mW

500mW

75% more performance in 17% smaller die area!

10,000

8,000

6,000

4,000

2,000

3 Cores

3.8 mm2

2 Cores

4.6 mm2

MIPS32 1004K

ARM Cortex-A9 MP

**Worst Case SS Corner Frequencies, Production Margins
ARM = 12T power opt, MIPS = 9T freq opt**

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Silicon Area Advantage

Two ARM Cortex-A9s

MIPS32 1004K **MIPS32 1004K** **MIPS32 1004K**
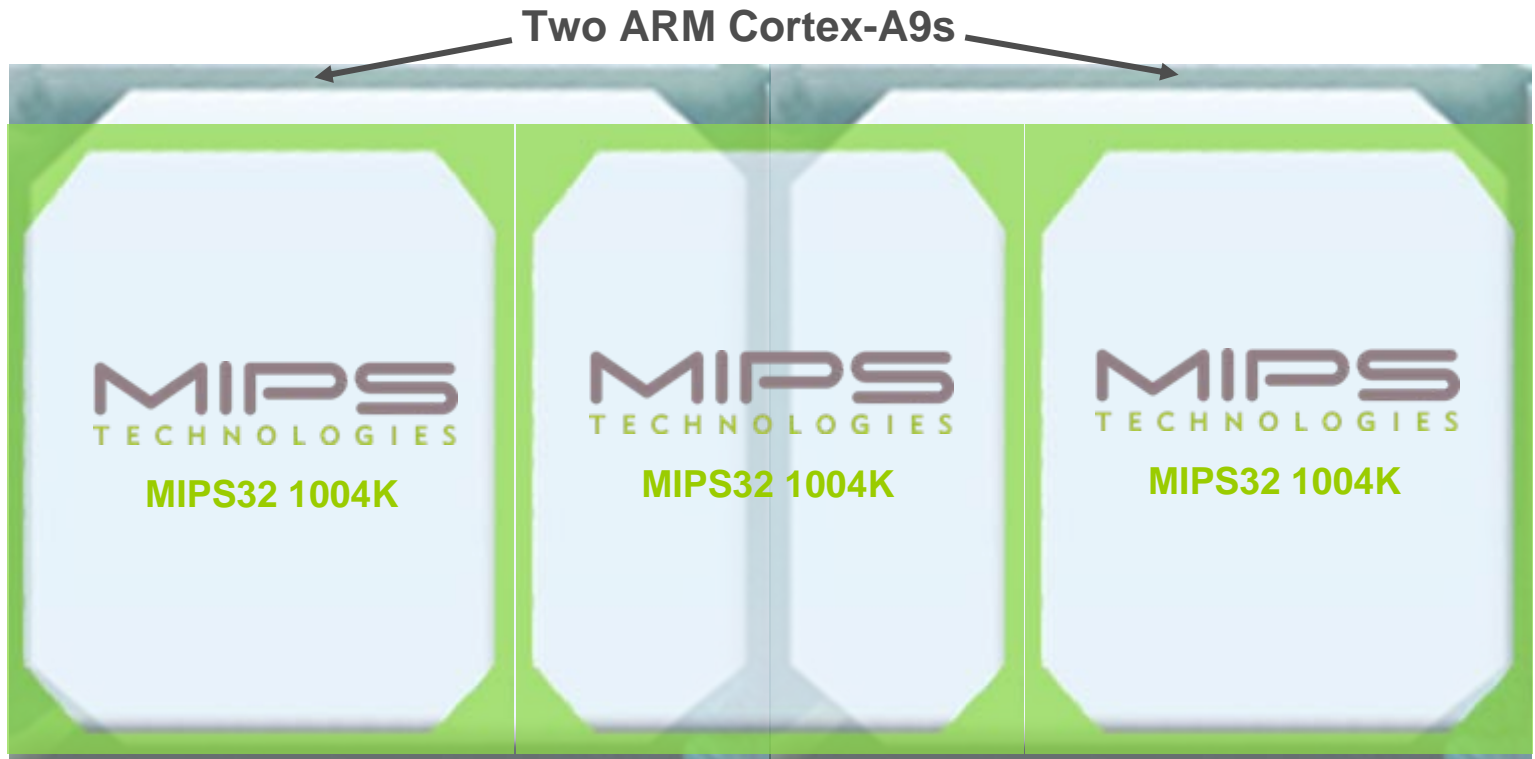
Three MIPS32 1004K Cores = 3.8mm2*
Two ARM Cortex-A9 Cores = 4.6mm2*

A 3-core MIPS 1004K occupies less die area than a 2-core ARM Cortex-A9—and consumes less power!

*Source: MIPS and ARM public data
ARM = 12T power opt, MIPS = 9T freq opt

4G LTE Results: Android on MIPS

SySDSoft Designing for a Wireless World	Processor: single core MIPS 24Kf 350Mhz	
Packet Size in Bytes	**DL Rate (Mbps)**	**UL rate (Mbps)**
1516	**150**	**50**
512	**150**	**50**
256	**148**	**50**
128	**102**	**35**
64	**66**	**16**

Achieving maximum throughput 40% better than the competition!
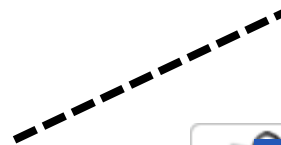
Results obtained on both Linux and Android OS; DL and UL data pushed simultaneously; An average of 95 MIPS needed during data transfer

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Android Enables All Embedded Devices

Content in the cloud

Android enables OEMs of any size to quickly bring connected products to market

Android TV:
Internet Meets Television Today

Search online and personal content

Access downloadable applications

Connect to social networks

Android TV can access all of Internet -- Today

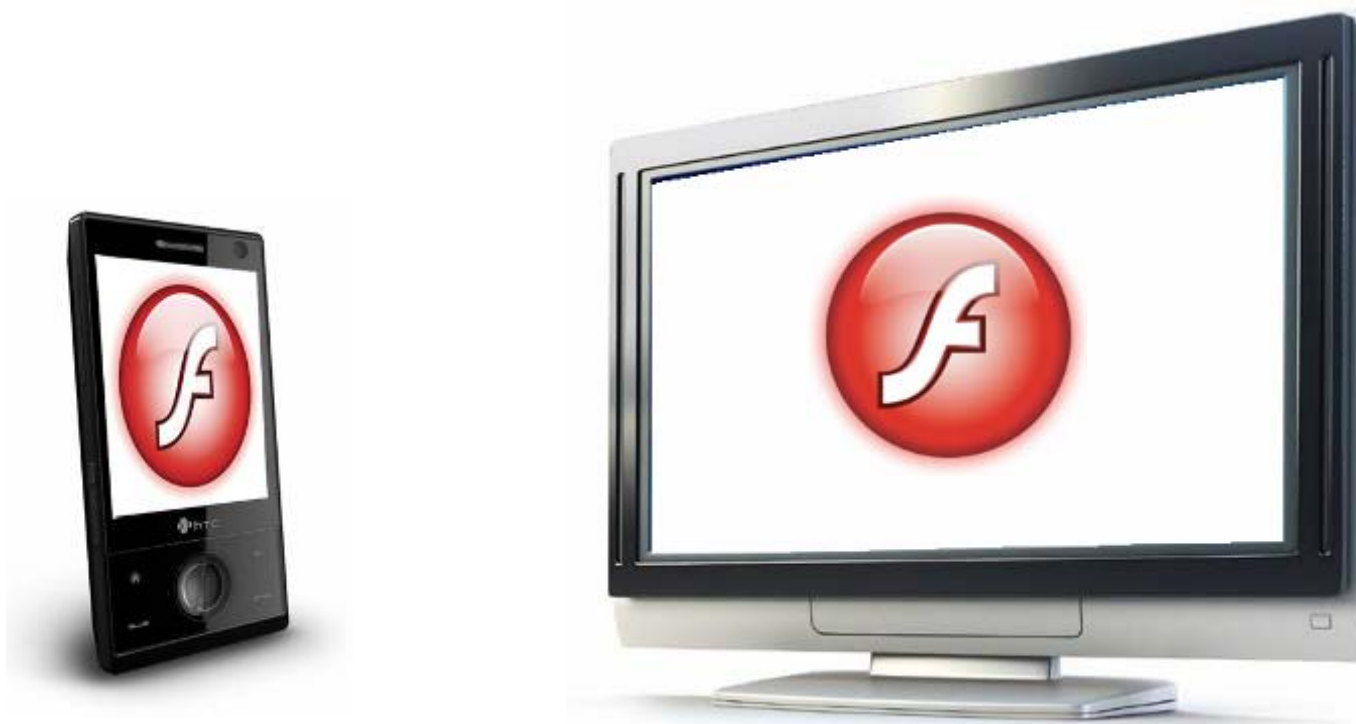Online Search

Accelerating Android Application Performance

Performance increase up to 5x with optimized Dalvik Turbo VM

Results obtained using CaffeineMark, EEMBC, Benchmark and LinPack

Platform Optimizations
for Digital Home and Beyond

Bringing Flash Player 10.1 to MIPS

Flash Player 10.1 to be available on MIPS at time of release; demonstrating to NDA customers now!

Supporting Rich, OPEN Web Graphics

VP8: a high performance video codec
designed for web content

**Google released VP8 video
codec to open source
WebM project**

**MIPS supporting VP8—
software optimized codecs &
RTL for MIPS-Based SoCs**

**Open source, royalty-free video codec will bring high-quality
video content and experiences to web-connected devices**

Symmetric Multiprocessing (SMP) Support for Android on MIPS

More software in phones➔ higher levels of processing power

MIPS delivers only multi-threaded multiprocessor IP

SMP support for MIPS32 already demoed—open source in August

Number of CPU Cores in Mobile Phones*

	2G	2.5G-3G	3.5G	pre-4G	4G
	1995	2000	2005	2010	2015
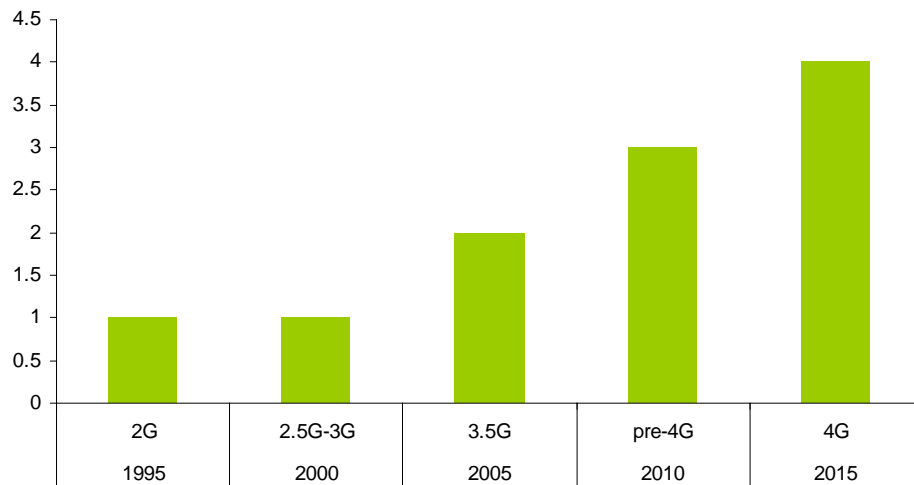
The next step in driving the MIPS architecture into smartphones and other advanced CE devices

* MIPS Estimates

MIPS: Enabling the Connected Consumer Experience

Number one processor
for the digital home

Highest performance;
Best power
consumption

64-bit for
high-performance
networking

Flexibility, openness,
freedom of choice

Industry's only
multithreaded
multiprocessor IP

Mobile design wins!

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Thank You!