ARM

Q3 2016 Roadshow Slides

ARM Holdings is a subsidiary of SoftBank

ARM Introduction

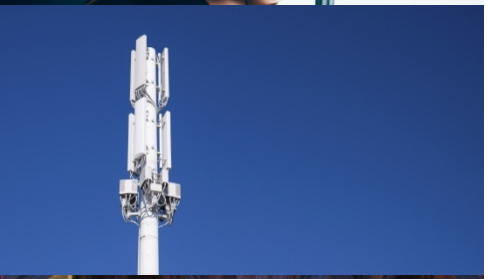
- Global leader in the development of licensable technology
  - R&D outsourcing for semiconductor companies
- Innovative business model yields high margins
  - Upfront licence fee – flexible licensing models
  - Ongoing royalties – typically based on a percentage of chip price
  - Technology reused across multiple applications
- Long-term, secular growth markets

>1,400 licences
Growing by >100 every year

16.7 bn ARM-based chips in CY2016

~15% CAGR over previous 5 years

>450 potential royalty payers
Industry leaders and high-growth start-ups; chip companies and OEMs



ARM's Strategy

- Maintain or gain share in long-term growth markets
  - From mobile phones to networking infrastructure and servers to embedded smart devices and automotive
- Increase value of ARM technology per smart device
  - Invest in developing more advanced processors with higher royalty rates
  - Physical IP and multimedia IP further increase ARM's value per chip
- Explore and exploit new opportunities in emerging applications created by the Internet of Things
- Invest to create a sustainable business, fit for the long term
  - Create superior returns by developing new technology that will deliver increased profitability and cash generation

ARM

History of ARM

Joint venture between Acorn Computers and Apple

1990

Designed into first mobile phones and then smartphones

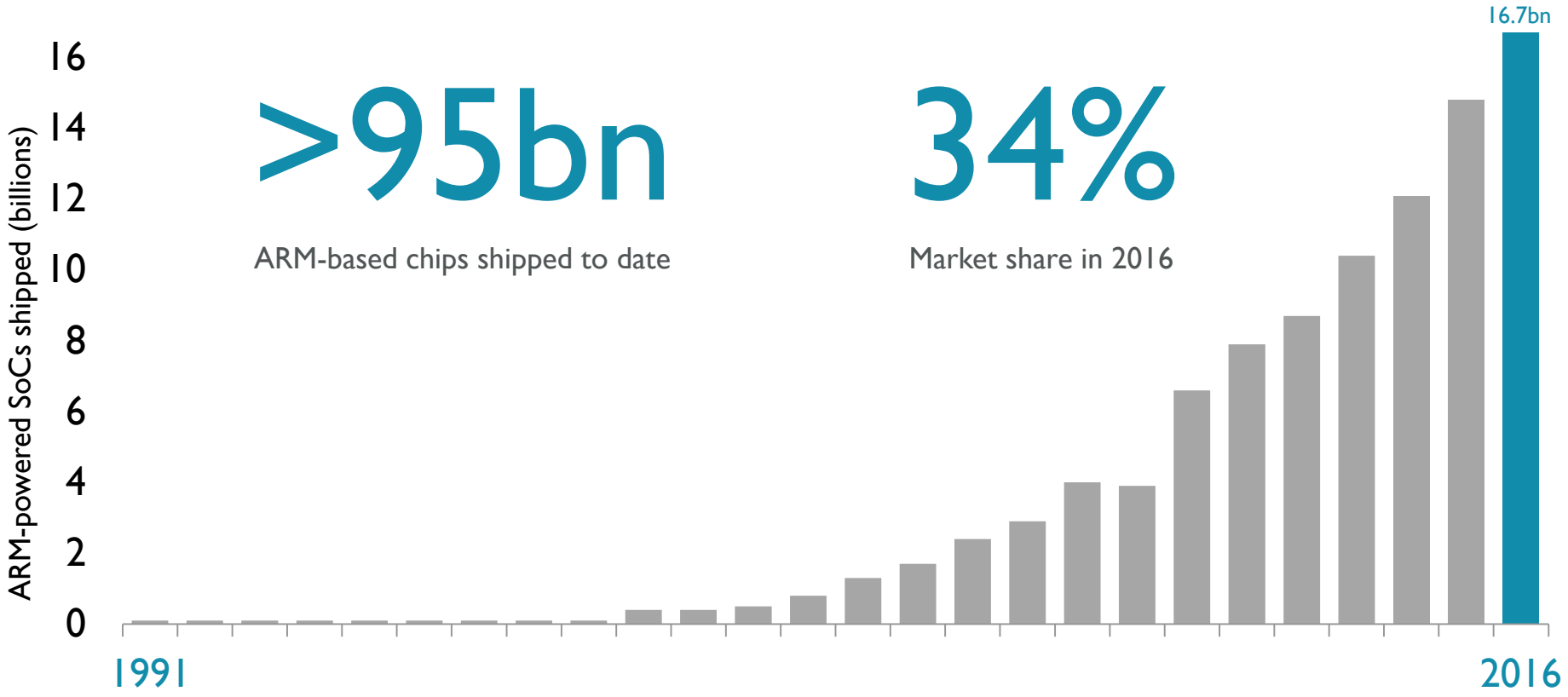
1993 onwards

Now all electronic devices can use smart ARM technology

Today

ARM

ARM-based chip shipments



>95bn

ARM-based chips shipped to date

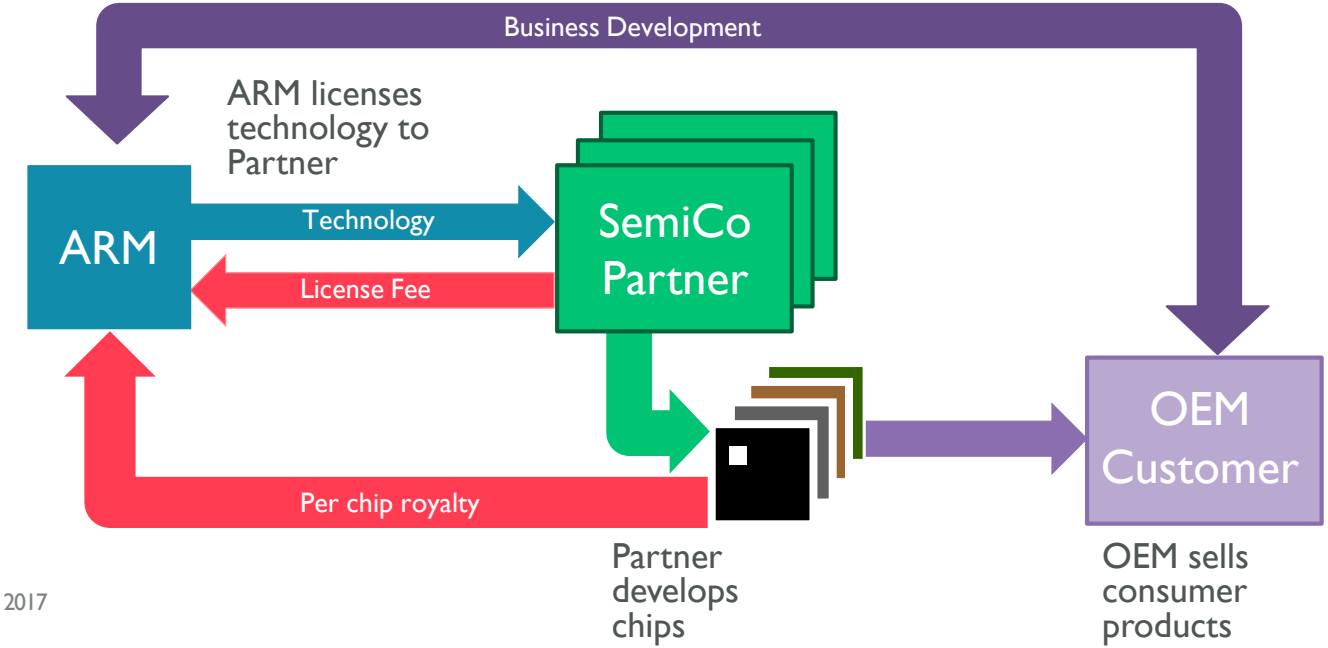
34%

Market share in 2016

ARM

ARM Business Model

- ARM develops technology that is licensed to semiconductor companies
- ARM receives an upfront license fee and a royalty on every chip that contains its technology



From Revenue to Profits and Cash

YTD 2016 Revenues	$m	£m	%revs
Licensing	479	345	37%
Royalty	716	569	56%
Software and Services	85	60	7%
Total	1,280	974	**100%**
Total Costs		472	
Adjusted EBITDA (£m)		**502**	
Operating Margin		52%	
Other expenses		331	
IFRS EBIT (£m)		**171**	

Over 95% of revenues earned in US dollars

Royalties approximately 50% of revenues

10% move in $/£ impacts profits by ~15% (forex impacts £ revenues *and* costs)

Strong revenue growth has driven operating margins and profits

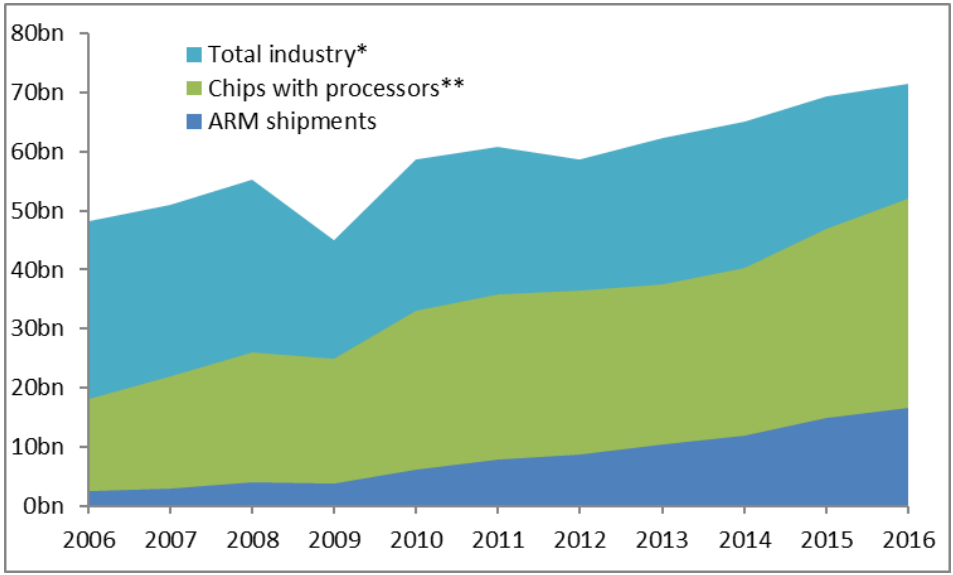
Includes expenses incurred by ARM during acquisition by SoftBank.
Excludes SoftBank's acquisition related expenses.

Financial numbers aligned with SoftBank reporting periods (01 April 2016 to 31 March 2017)

ARM

ARM's opportunity continues to broaden

- Semiconductor industry continues to grow – 3% by volume, 1% by value over past 5 years
- Proportion of chips with processors is increasing – 70% in 2016
- ARM is gaining share within the "chips with processors" segment of the industry – 34% in 2016



* Data source: WSTS, January 2016 and ARM, Industry volume excluding analog and memory

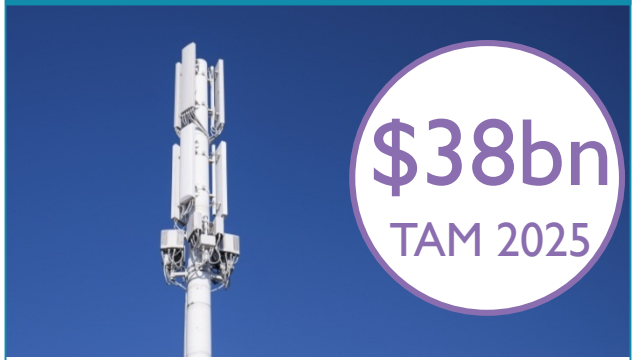
** ARM estimates

ARM's main growth markets

Application Processors

- Smartphones, tablets and laptops
- Apps processor, modem, connectivity, touchscreen and image sensors
- Apps processor: Increasing proportion using ARM technology with higher royalty per chip from ARMv8-A, octa-cores, graphics and physical IP

Networking & Servers



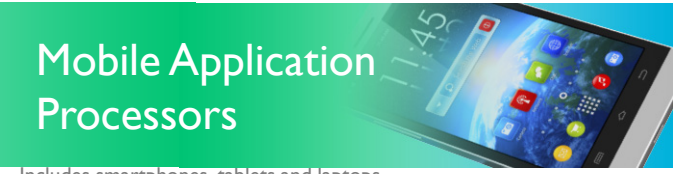
- Base stations, routers, switches, and servers for cloud and data centres
- Networks evolve to cope with increased data at lower latency: virtualisation, integration and programmability
- Most major chip vendors have announced ARM-based products

Embedded Markets

- Automotive, white-goods, wearables, smart devices in industrial and utilities
- Microcontrollers, smartcards, embedded connectivity chips
- 200 companies have licenced ARM processors for use in embedded intelligent devices

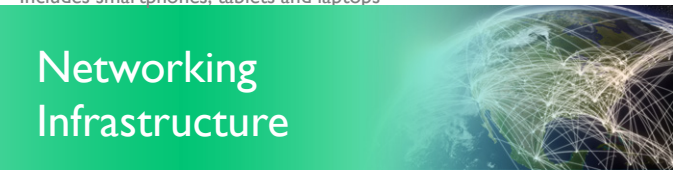
ARM

ARM's expanding opportunity



Mobile Application Processors

Includes smartphones, tablets and laptops



Networking Infrastructure

Servers

Embedded Intelligence

Includes microcontrollers, smartcards and non-mobile connectivity. Excludes automotive

	Share 2016*	TAM 2016	TAM 2025
Mobile Application Processors	90%	$20bn	$30bn
Networking Infrastructure	17%	$13bn	$18bn
Servers	<1%	$15bn	$20bn
Embedded Intelligence	30%	$23bn	$40bn

* 2016 ARM Market Share by Volume
† Total Available Market (TAM)

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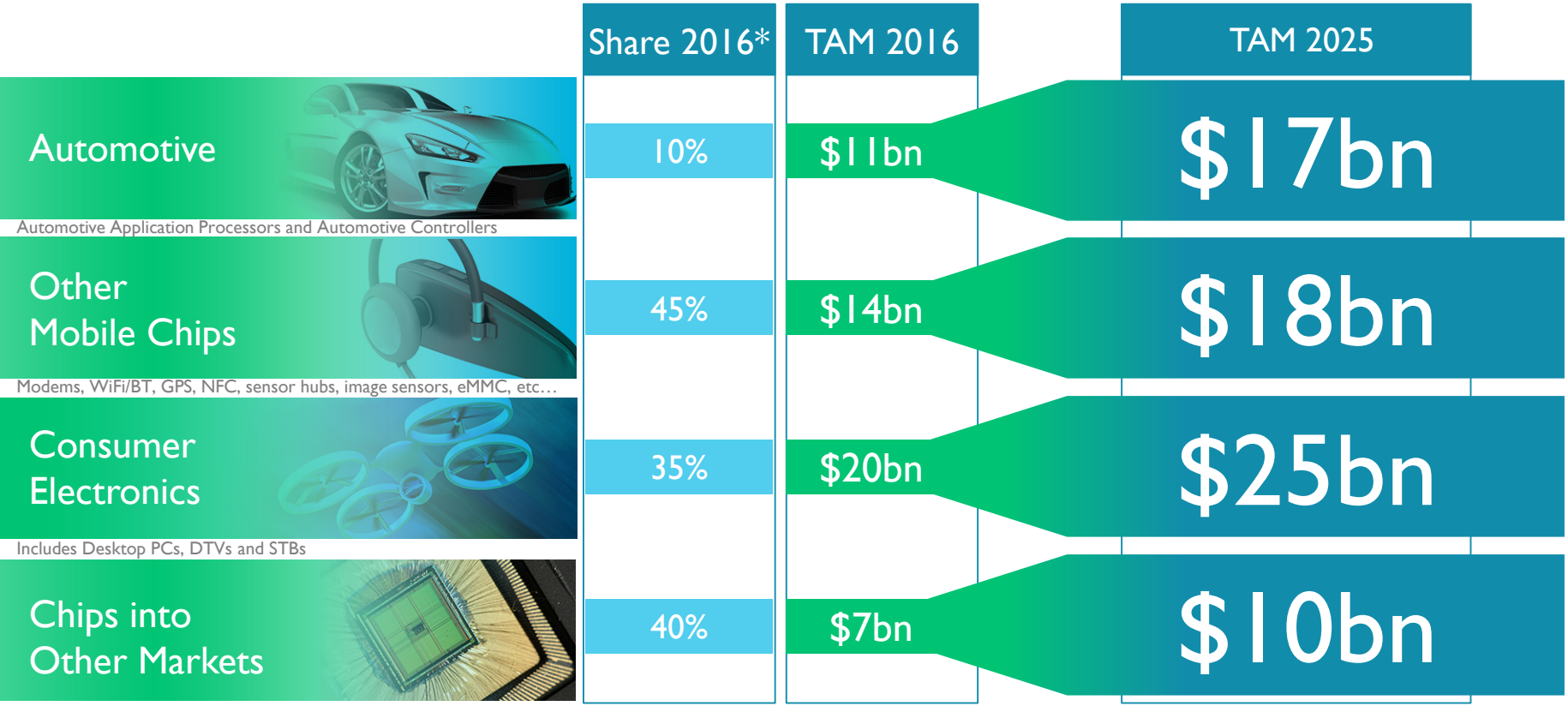
ARM's expanding opportunity

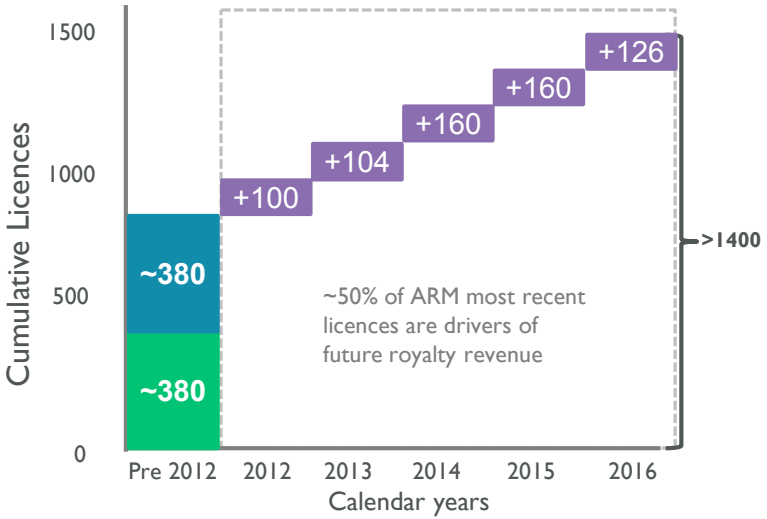


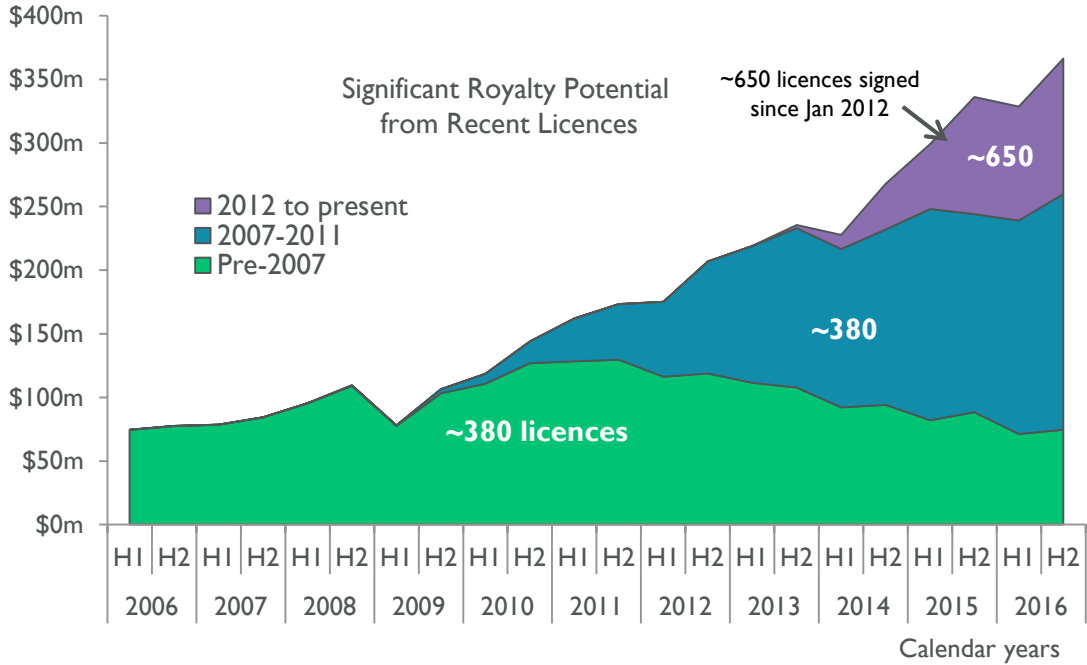
* 2016 ARM Market Share by Volume
† Total Available Market (TAM)

ARM

Licensing enables future royalties

- ARM signed 126 licences in CY2016
- ARM's current royalty revenues are derived from licences signed many years ago
- Growing base yields royalty revenues over long period





Licensing drives market share

ARM gains share by winning designs at leading semiconductor companies

		2016* Share
Mobile Applications Processors **		90%
Networking Infrastructure		17%
Servers (ARMv8-A based)		<1%
Embedded Intelligence		30%
Automotive		10%
Other mobile chips		45%
Consumer electronics		35%
Chips into other markets		40%
3D Graphics		50%

- Shipping mainly ARM-based chips
- Shipping some ARM-based chips
- Public ARM design wins, but not yet shipping
- No ARM design win or not yet public

Change in latest quarter

- 2 companies re-equipped
- 2 companies re-equipped

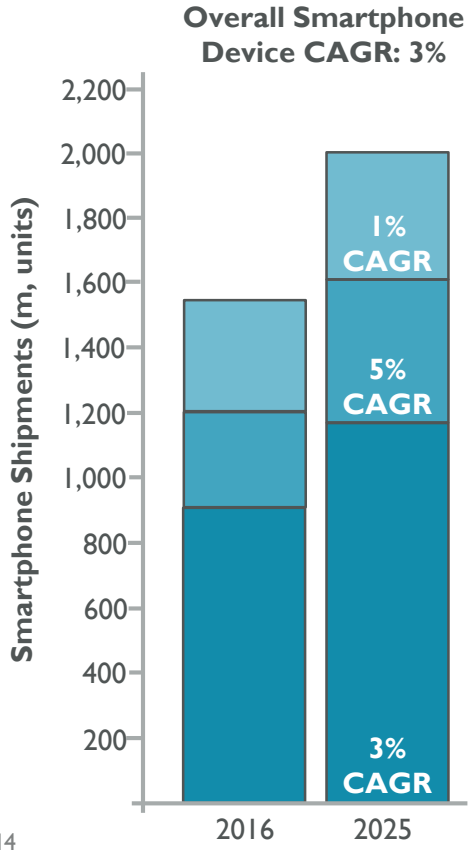
Based on current market shares and ARM's view of how these markets may develop.

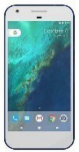
ARM will update the chart on the left only when design wins become public

*** Calendar year**
**** Includes smartphones, tablets and laptops**

ARM

2025 opportunity in smartphones





2020 Smartphone Chips

Applications Processor	$15-$20	
Connectivity, Sensors	$5-$10	
Applications Processor	$5-$15	
Connectivity, Sensors	$2-$3	
Applications Processor	< $5	
Connectivity	$1-$2	

ARM's advanced technology commands a higher royalty percentage per chip

Smartphone penetration

- ARMv8-A technology: 65%
- Mali graphics: 50%
- High core count: 30%

Additional opportunities to grow royalty percentage

- Mali video, imaging and display technology
- Computer vision
- Virtual/augmented reality
- Physical IP
- Machine learning inference engine
- Increased connectivity

Premium Smartphones

Mid-range Smartphones

Entry-level Smartphones

>5% Smartphone Royalty Growth

Source: Gartner and ARM

ARM

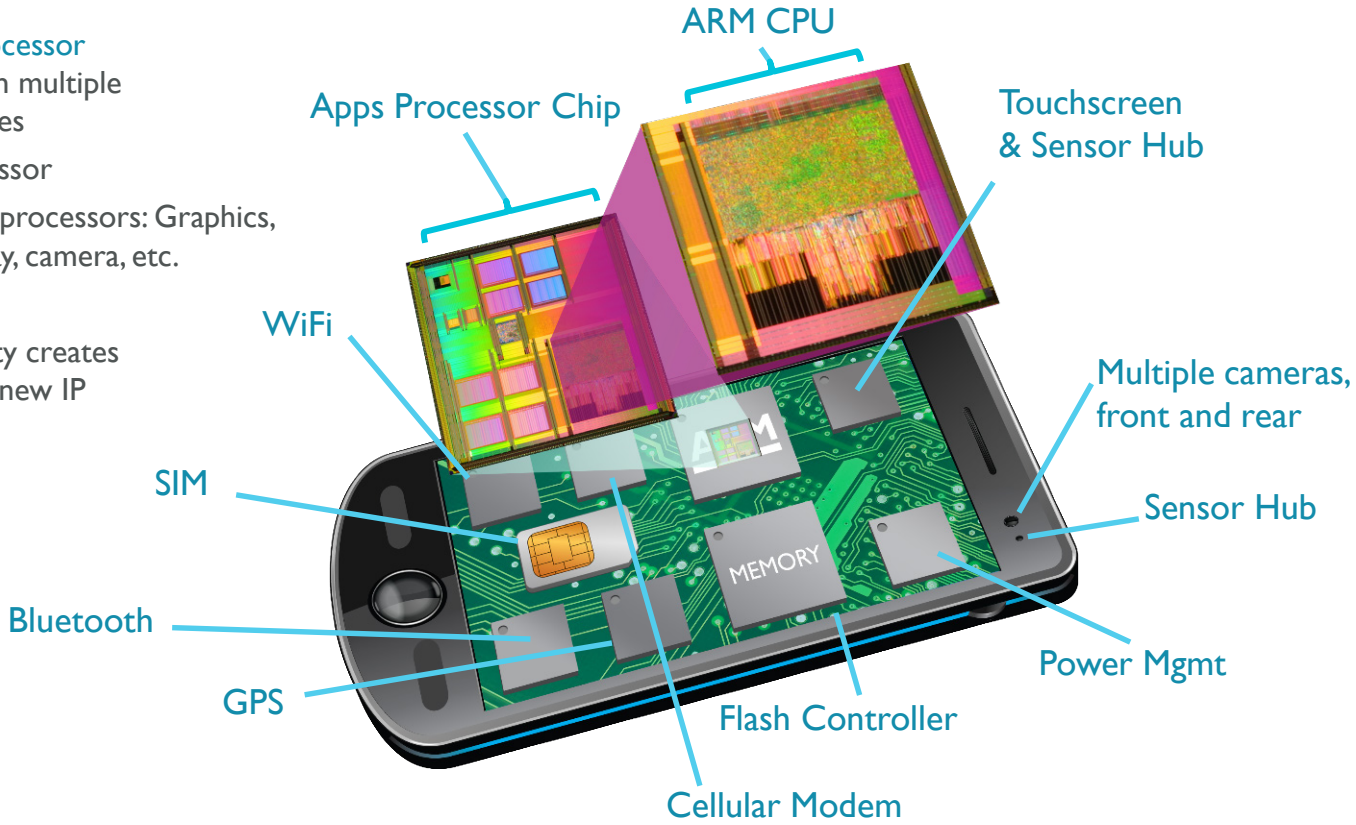
2025 opportunity in smartphones

Advanced consumer products are incorporating more and more ARM technology

Applications Processor chips can contain multiple ARM technologies

- ARM Processor
- Multimedia processors: Graphics, video, display, camera, etc.
- Physical IP

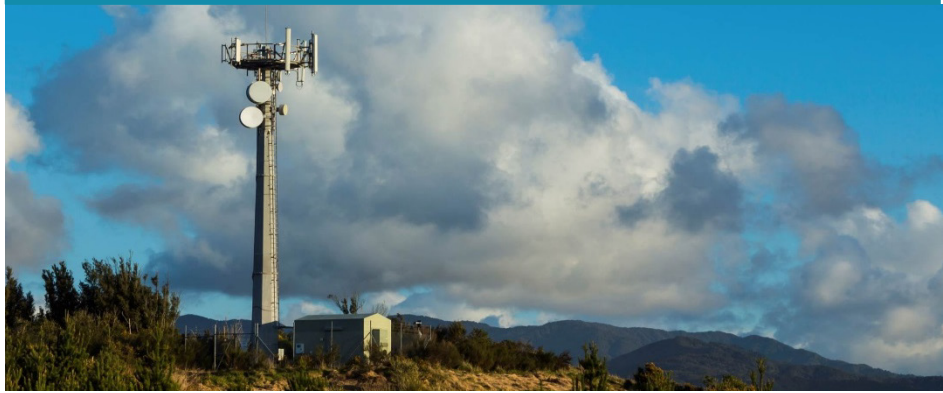
New functionality creates opportunity for new IP



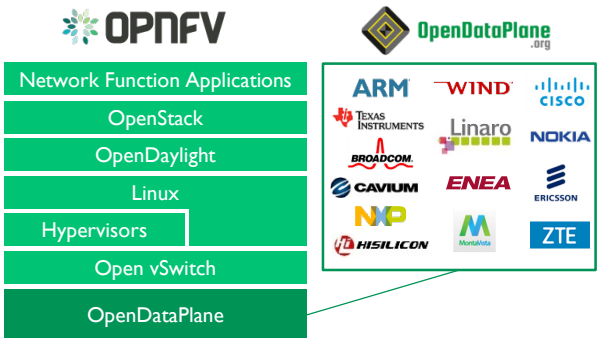
Networking infrastructure opportunity for ARM

- 5G networks will provide
  - High-speed, low latency connectivity consumers
  - High-volume low-data rate connectivity for IoT
- 5G will need heterogeneous network equipment for macro- to femto-cells
- Distributed virtualised functions enables efficient use of the network
- ARM is working with software community to expand availability of virtualised network functions

Major networking chip manufacturers have licensed ARM technology



Network functions are being optimised for ARM-based SOCs



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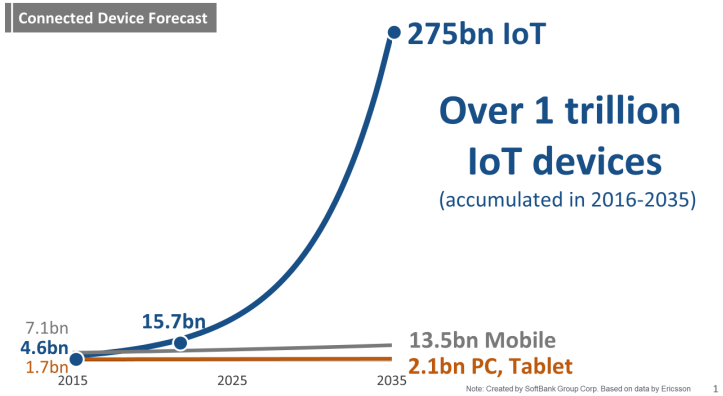
Server opportunity for ARM

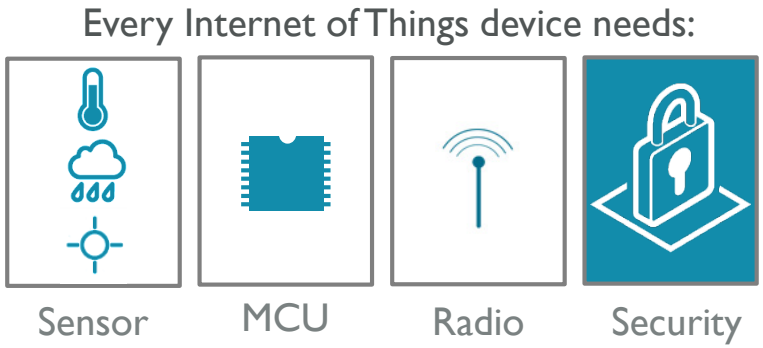
- Web/cloud scale companies can reduce costs with servers optimised for specific workloads
- ARM business model enables increased innovation and differentiation
- Range if design wins in HPC, webhosting, machine learning and analytics
- New workloads (i.e. containers and microservers) are ideal for ARM multicore approach

Barcelona Supercomputer selects ARMv8-A for Mare Nostrum 4

Fujitsu and RIKEN select ARMv8-A for the Post-K supercomputer

Internet of Things opportunity





ARM has high share of technology components needed to create a smart, secure connected device

- >75% market share — advanced* microcontrollers
- >60% market share — wireless connectivity
- >90% market share — advanced* smartcards

ARM-based technology is the platform for many Internet of Things devices

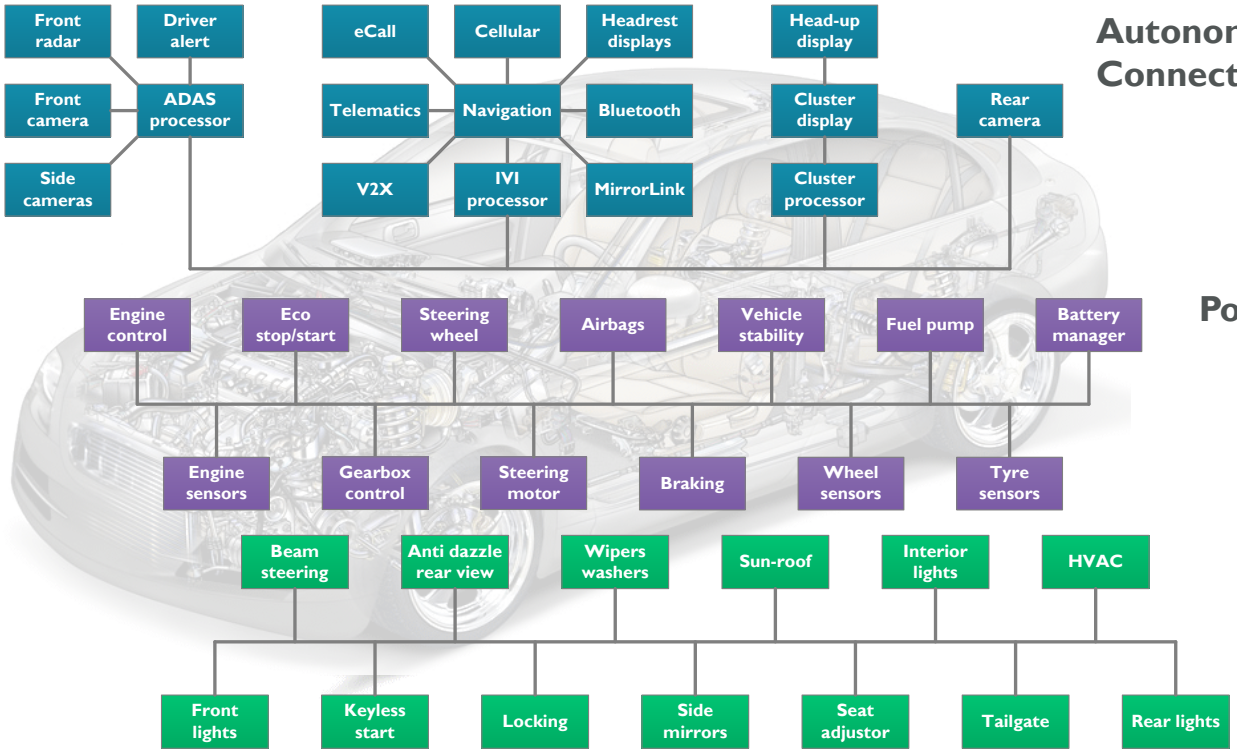
- >90% market share — wearables
- >90% market share — drones
- >50% market share — connectivity in cars

* Advanced 32-bit devices

ARM

ARM's automotive opportunity

Functional safety, consolidation, partitioning, virtualisation, performance, power, cost

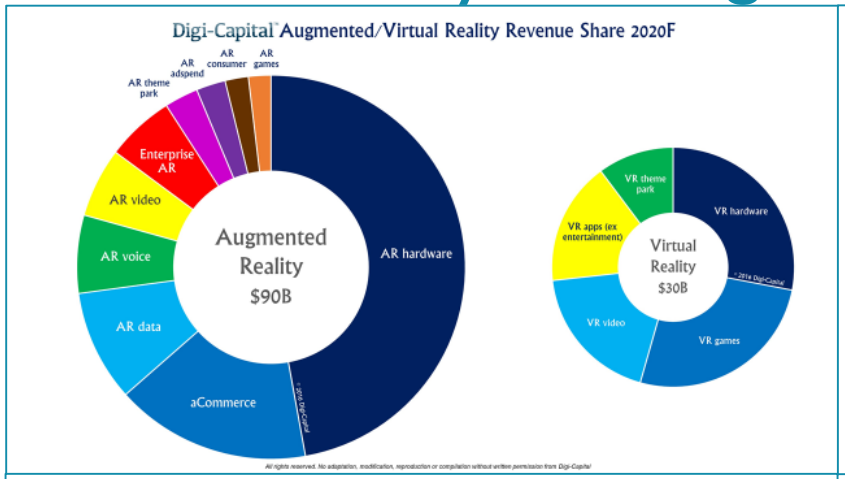


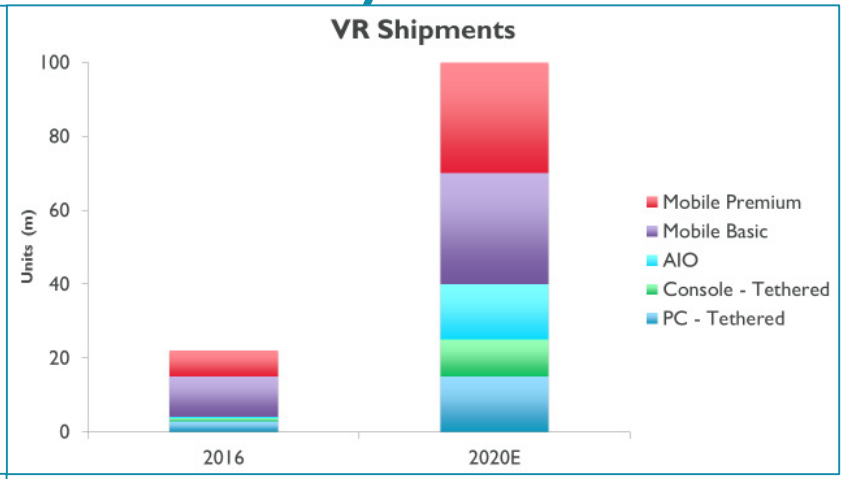
Autonomous driving, ADAS, Cluster, Connectivity

Powertrain, chassis

Body electronics, sensors, actuators, communications

Virtual reality and augmented reality





Requirements for smooth mobile AR/VR

High resolution	2k to 4k per eye
High performance	60fps (120fps with asynchronous "Timewarp")
Responsive rotation & position tracking; Increases immersion & experience	<20ms "motion to photon" 6 degrees of freedom
Mobile power envelope	~4W TDP

ARM

Mali is #1 VR graphics processor

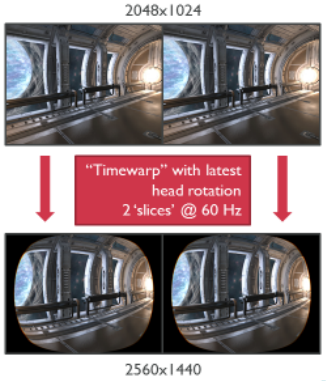
Mali graphics processor is used in around 50% of all VR head-mounted displays including some:

- Samsung Gear VR
- Google Cardboard VR and
- Other all-in-one VR HMDs

Virtual reality and augmented reality

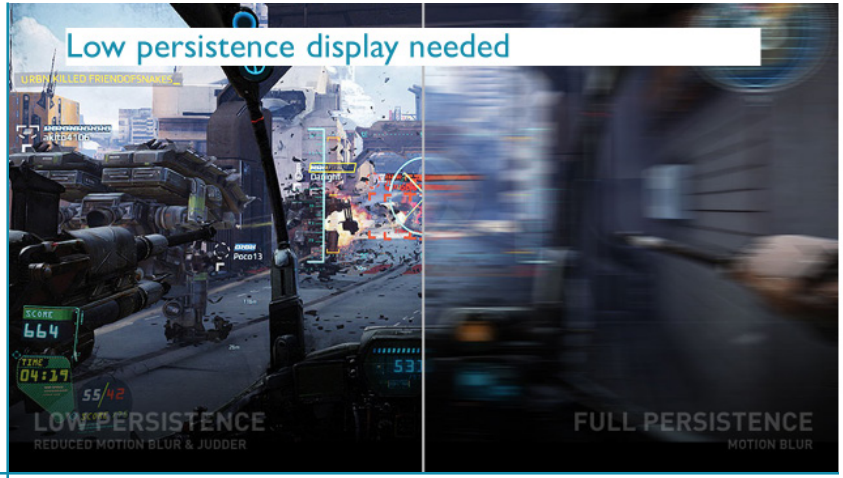
Asynchronous timewarp

- Decouple rotation from graphics pipeline
- Draw larger scene than needed and determine scene to display at the last moment

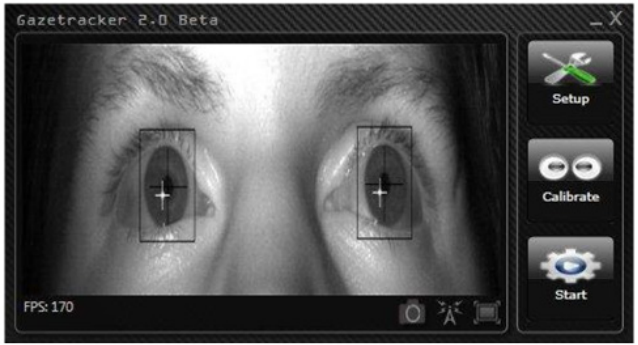


ARM

Low persistence display needed



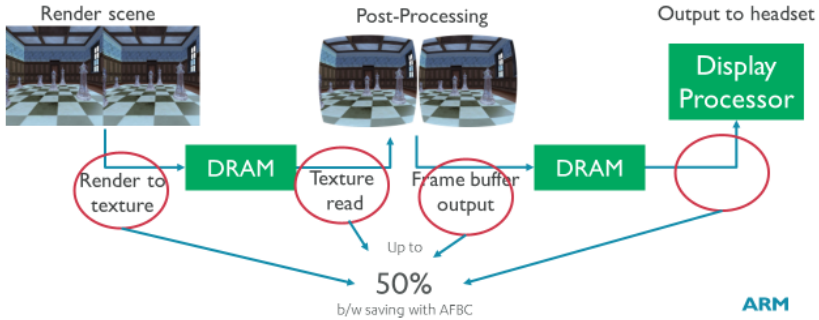
Gaze Tracking and Foveated Rendering



Render in full resolution quality where gaze is directed

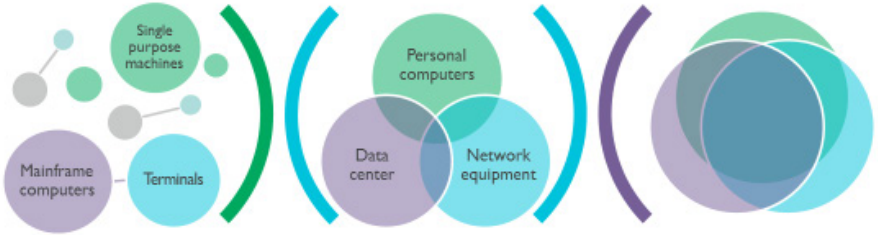
ARM's Frame Buffer Compression for low power

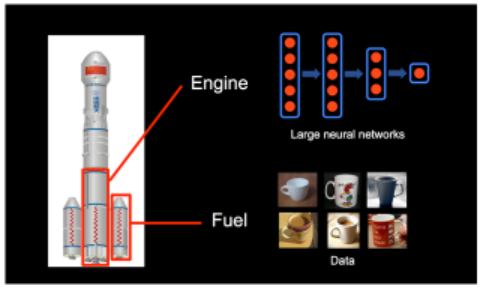
Post processing step/barrel distortion doubles fragment bandwidth

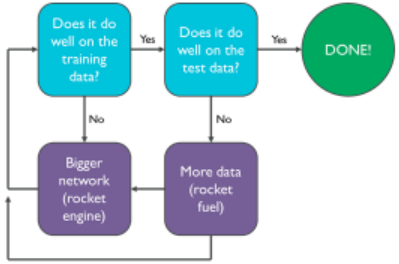


ARM

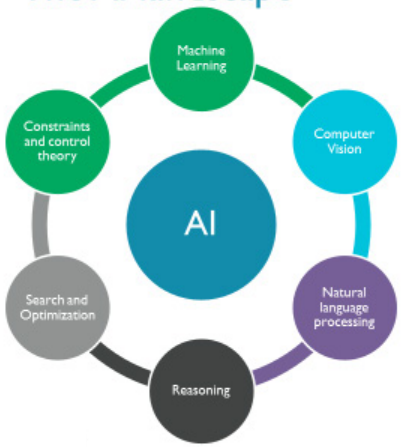
Machine learning in client devices

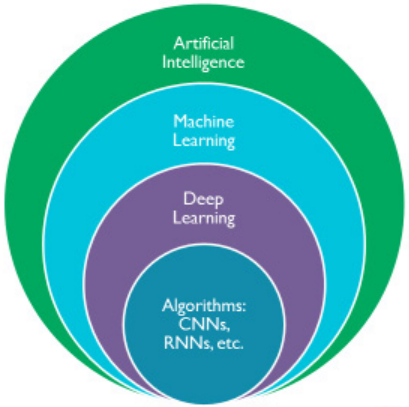






The AI landscape





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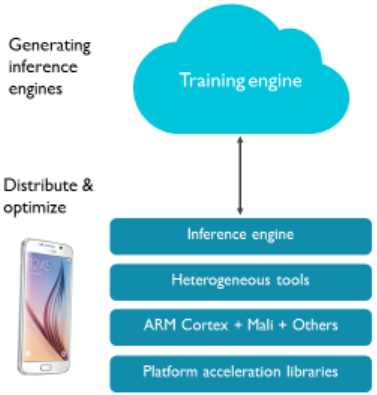
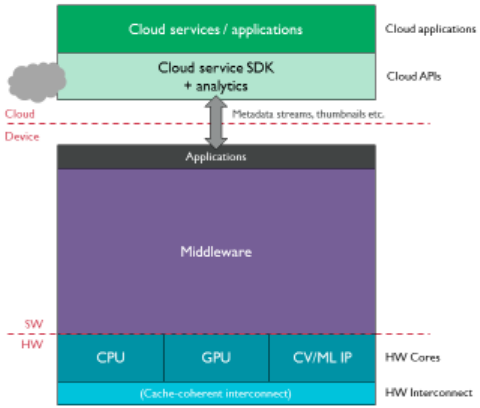
Machine Learning process on ARM





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The speech recognition process

Speech

Feature Extraction

Features

Acoustics — ih t s iy z iy t uw r eh k ah n ay z s p iy ch

Phonemes

Word formation — it's easy to wreck a nice beach

Words

Language Model — it's easy to recognize speech

Text

Adapted from: http://www.cs.columbia.edu/~mcollins/6864/slides/asr.pdf

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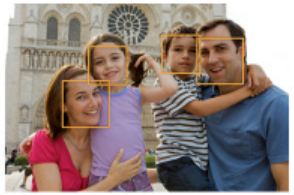
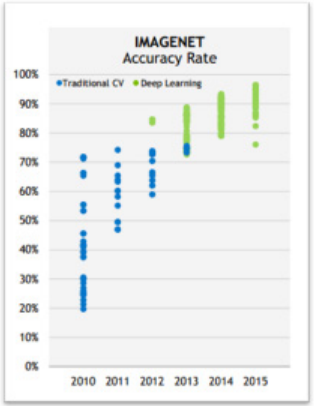
Face / smile / gesture / object recognition





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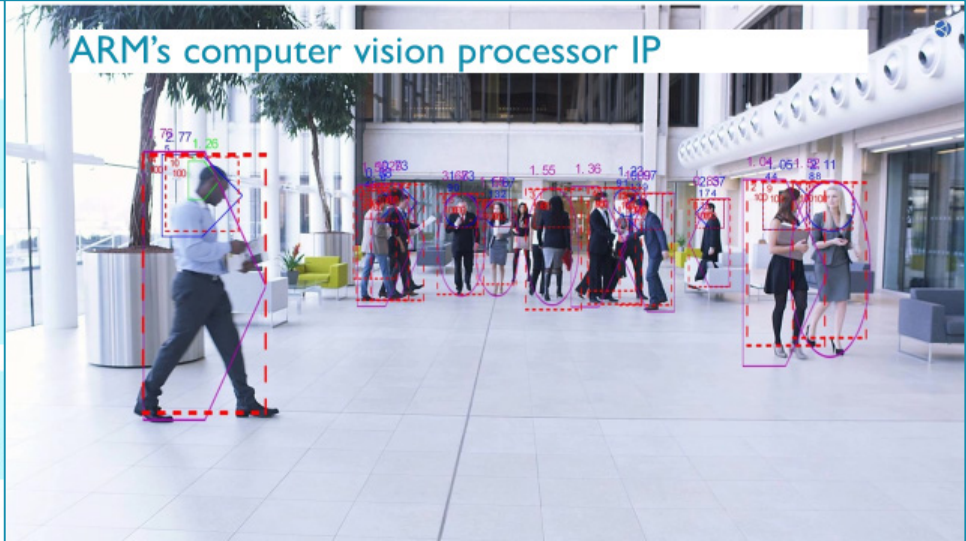
Automatic speech recognition an ARM based devices

- Keyword spotting of simple commands
  - "OK Google" / "Set alarm for 7"
  - Only learn one voice saying a range of words

- Large Vocabulary Continuous Speech Recognition (LVCSR)
  - Dictation/transcription, virtual assistant, call centres
  - Requires dictionary, knowledge of grammar

- Sound monitoring
  - Early / automatic anomaly and fault detection

ARM's computer vision processor IP



Qtr ending Dec. 2016 – Financial summary

Revenues ($m)	Q3 2015	Q3 2016	Growth
Licensing	158	**229**	45%
Royalty	216	**248**	15%
Software and Services	33	**31**	-6%
Total ($m)	407	**508**	25%
Revenues (£m)			
Licensing	104	**169**	63%
Royalty	152	**210**	38%
Software and Services	22	**23**	5%
Total (£m)	278	**402**	45%
Operating expenses (£m)	125	**168**	34%
Adjusted EBITDA (£m)	153	**234**	53%
Other operating expenses (£m)	23	**7**	-70%
Depreciation & amortisation	10	**12**	20%
IFRS EBIT (£m)	120	**215**	79%

Q3 licensing exceptionally strong as some licenses were delayed until after the acquisition closed

Good royalty revenue continues to increase at long-term historic growth rates

Sterling revenues benefitted from a 14% fall in value of Sterling vs US Dollar

15% increase in total headcount
Currency impact of US-based employees
New long-term remuneration scheme

Ending of previous share-based remuneration scheme

ARM

Qtr ending Dec. 2016* – Progress against strategy

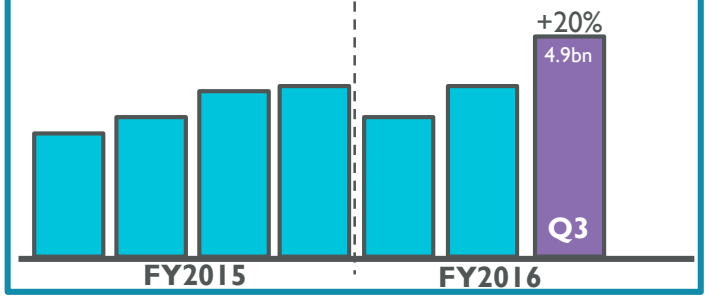
Licences signed for broad range of end markets

22 Cortex-M for automotive and IoT

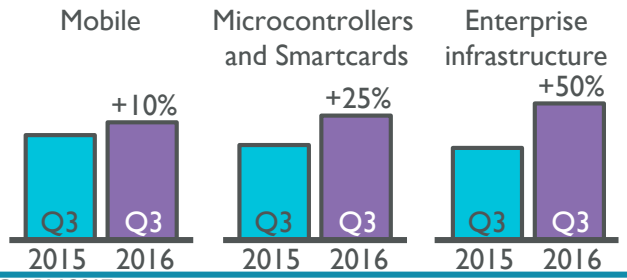
7 Cortex-A for Mobile, and Enterprise

8 Mali IP for Mobile and Consumer

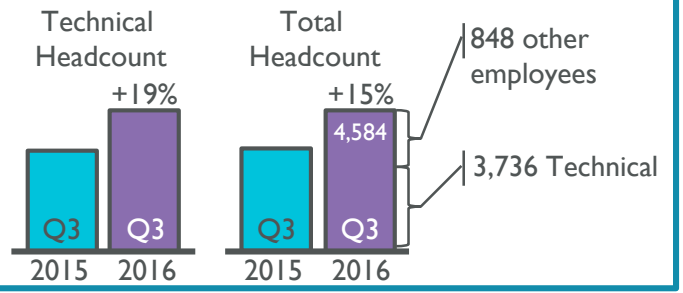
Reported Royalty Units Growing



Key market performance (growth in reported royalty units)



Investing in Future Technology



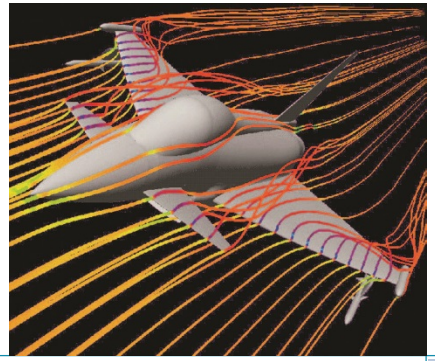
* SoftBank's financial year runs from April 01 to March 31.

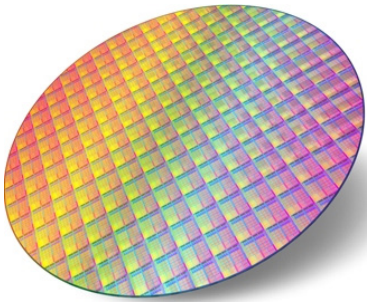
ARM

Investment leading to technology adoption

Introducing technologies for a broad range of industry-leaders in different markets

ARM acquires Allinea
Leading supercomputer software tools company

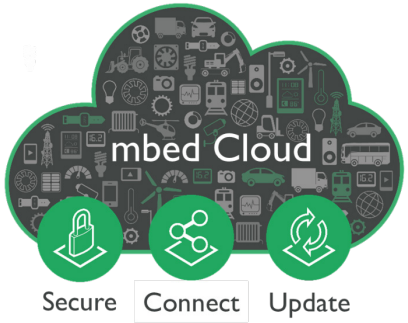


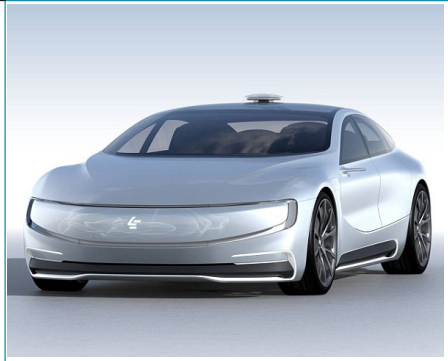


ARM announces technical information for TSMC 7FF

Including a new memory and power grid architecture for SOCs; and partnership with Xilinx who intends to be one of the first companies to deploy FPGAs made with TSMC's 7nm FinFET process

ARM announces mbed Cloud SaaS to securely manage IoT devices





ARM and OpenSynergy announced the first software hypervisor for safety critical systems – addressing increasing complexity in autonomous vehicles

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- Most quarters ARM hosts a series of investor events. Recordings of these events are available on the ARM investor website at www.arm.com/ir
- Currently available:
  - Intelligent buildings whitepaper by Ani Deodhar, Segment marketing manager for IoT Solutions
  - Machine learning in client devices presentation by Jem Davies, General Manager of ARM's Media Processing Group