# mbed OS
# Silicon Partner Workshop

**ARM**      Introduction and Objectives

Wyboston Lakes
27th March 2017

# Welcome!

# Agenda

- mbed OS update

- Objectives for the week

- Meet the team

- Format for the week

- Dinner!

**ARM**

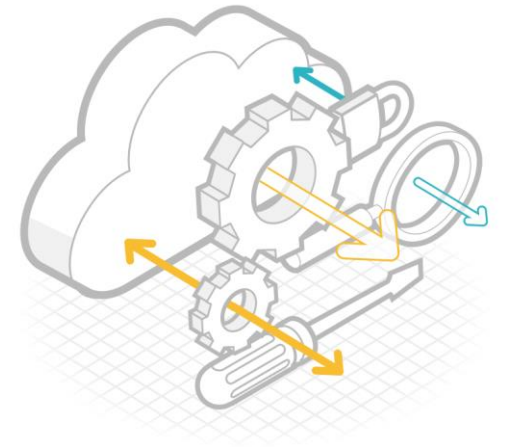# mbed OS update

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# IoT is driving the inevitable move to "Platform OSes"

- IoT implies a <u>disruptive jump in complexity</u> for embedded software
  - Common requirements: Connectivity → Security → Manageability
  - Diverse requirements: Target support, component and middleware support, features

- The industry at large will <u>adopt platform OSes for projects to succeed</u>
  - The cost and risk of projects building from scratch or just on an RTOS will be too high
  - A platform OS will lower the barrier for new entrants and align industry investments

- IoT products will <u>require device management services to succeed</u>
  - Services enable new functionality, new business models and reduce risk, creating a lot of value
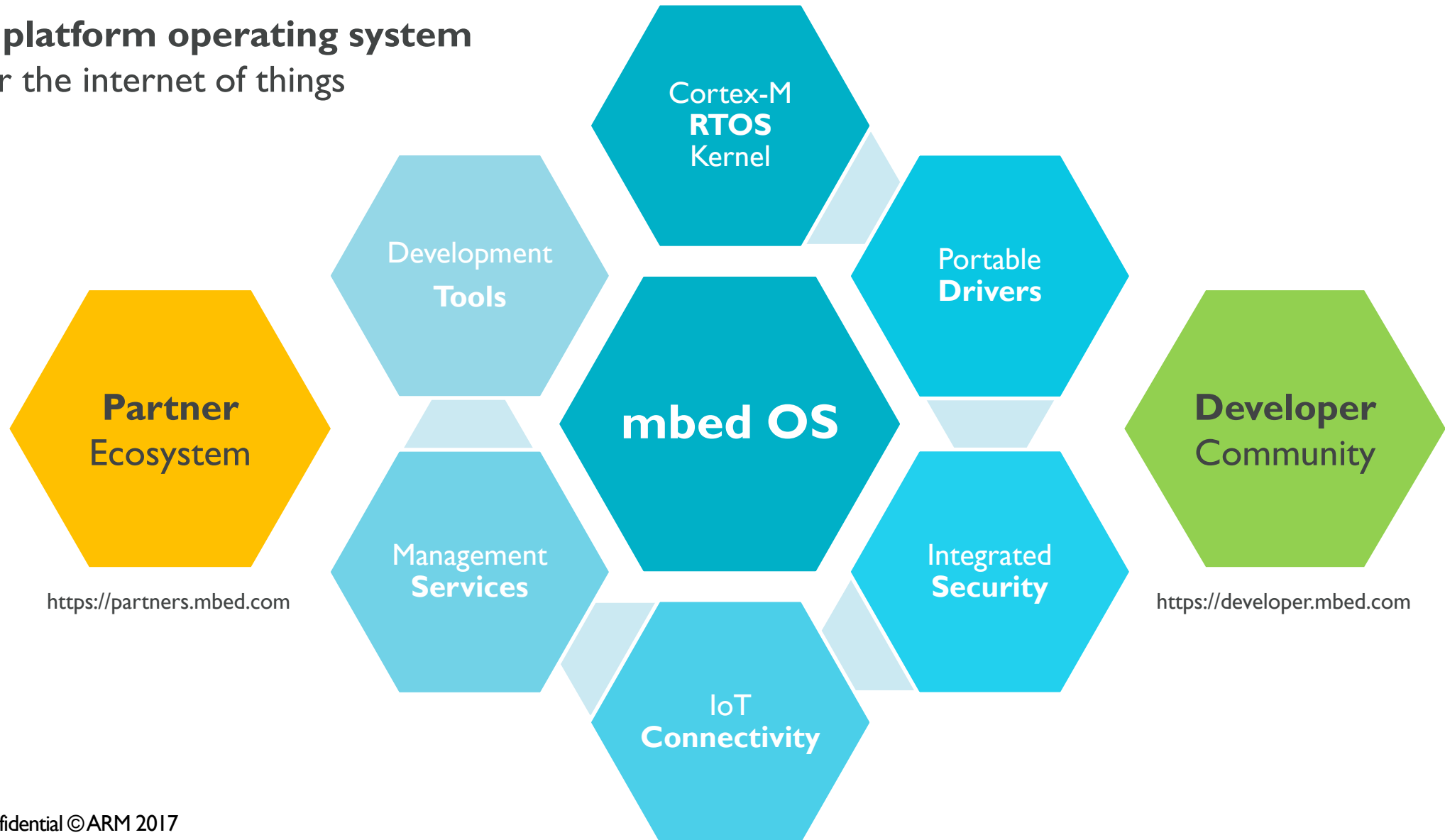  - Services will become one of the essential components within a platform OS

**ARM**
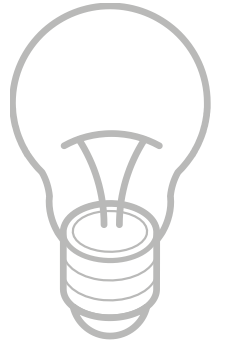
# Platform OS Requirements

- Accelerate the **development** of IoT devices
  - Integrate all the necessary software components needed for constrained IoT devices (MCUs)
  - Bring modern development methodologies and choice to MCUs to improve productivity
  - Provide OS functionality and APIs across many vendor solutions to enable choice

- Accelerating the **deployment** of IoT devices
  - Provide standardised connectivity to the cloud across different transports
  - Provide manageability from the cloud to open opportunities and reduce cost/risk

- Develop and leverage an **ecosystem**
  - Freely available and open source to remove barriers to entry and enable adoption
  - In collaboration with partners to provide maximum gearing of investment for everyone
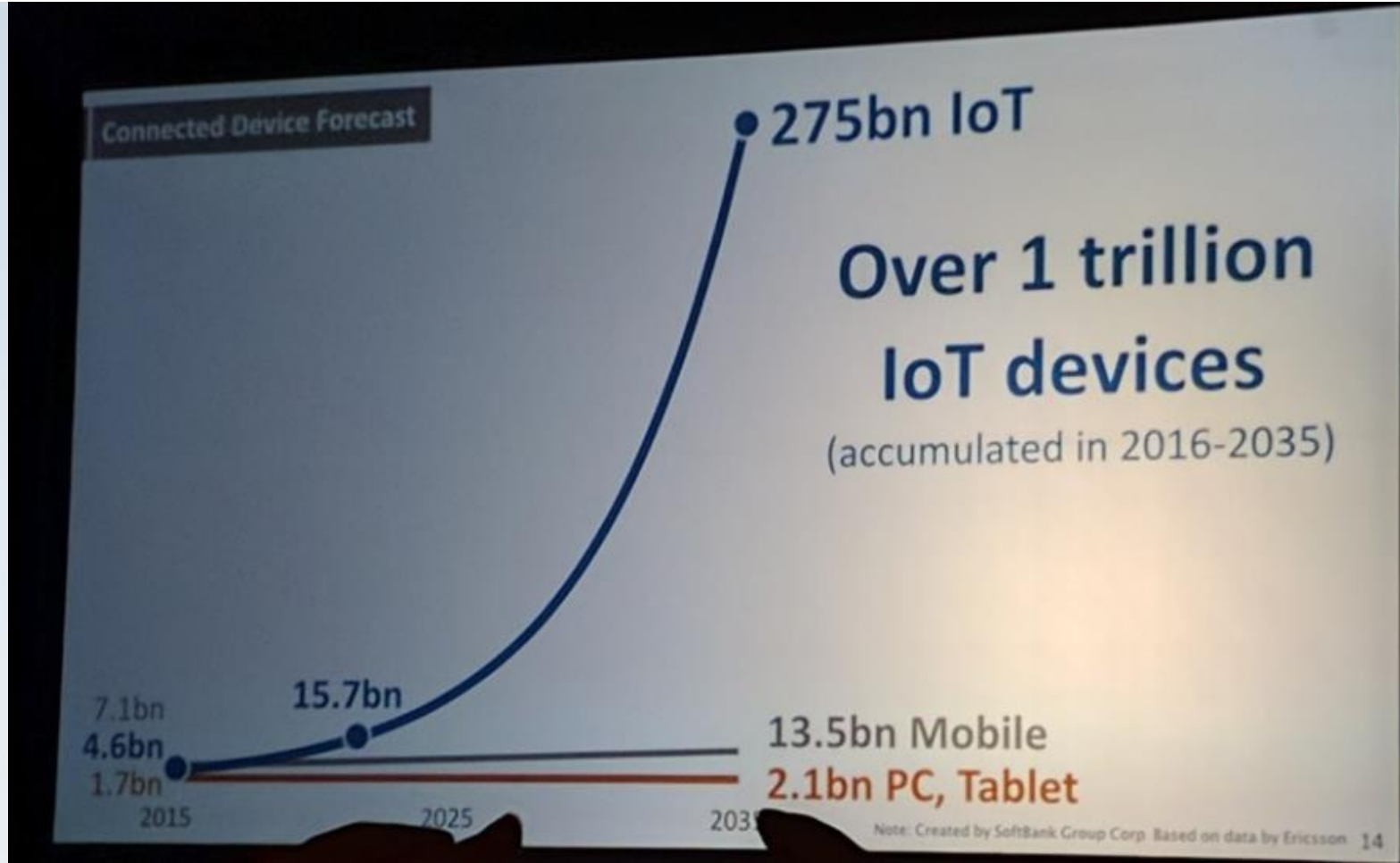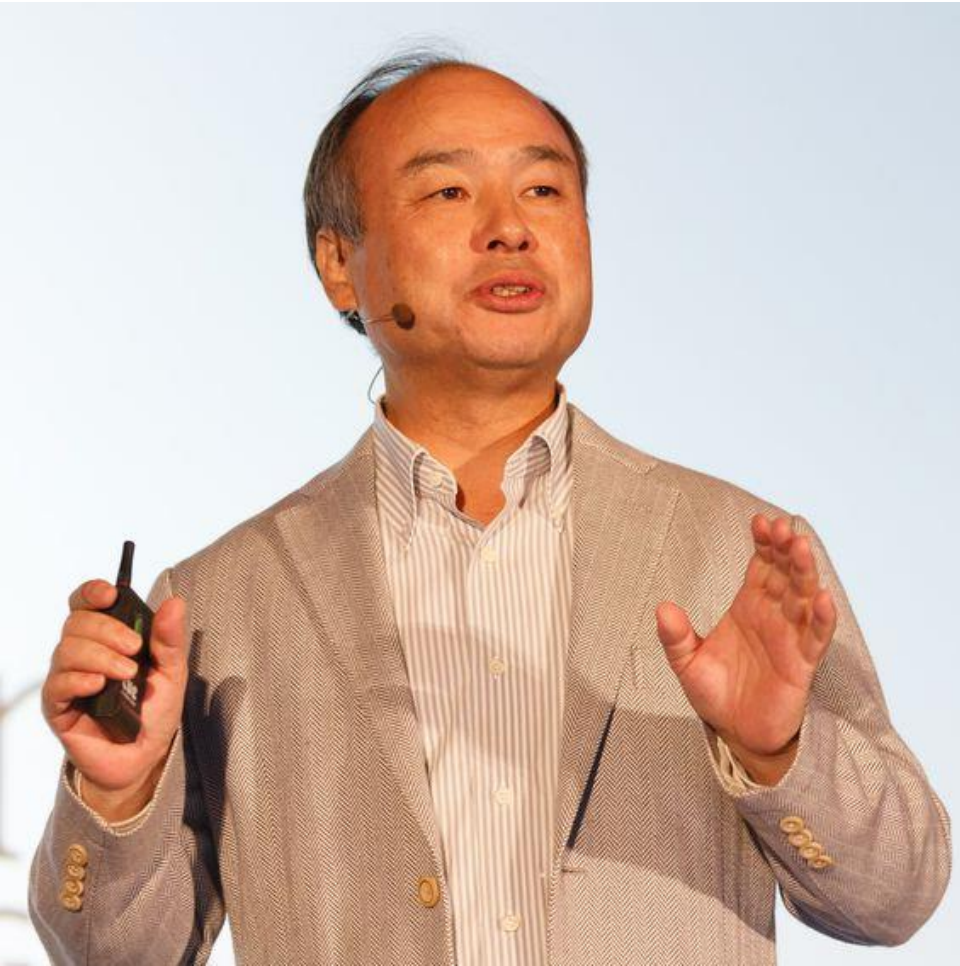  - The tools and web infrastructure to support an ecosystem and create network effects

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# mbed OS 5

A **platform operating system**
for the internet of things

Cortex-M
**RTOS**
Kernel

Development
**Tools**

Portable
**Drivers**

**Partner**
Ecosystem

**mbed OS**

**Developer**
Community

https://partners.mbed.com

Management
**Services**

Integrated
**Security**

https://developer.mbed.com

IoT
**Connectivity**

**ARM**

# Go Go Go!

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# 2017 themes

- **#1 in IoT connectivity**
  - → A single platform OS that can reliably address the diversity of IoT node connectivity requirements

- **Security and mbed Cloud services integrations**
  - → Solving the end-to-end device security and management problems faced by product manufacturers

- **Relentless progress in quality, features and support**
  - → Accelerate mbed OS evolution with a high cadence clockwork delivery and commercial support

- **Running on wireless modules**
  - → Simplify professional product development and design-ins

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# mbed OS Connectivity

LAN

Ethernet

BLE

WiFi

Thread

WAN

Cellular

LoRaWAN

Sub-GHz 6LoWPAN

NB-IoT

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# mbed OS Security and Services

Deploy firmware

Manage and group devices

## Device Management
*Manage devices, view their activity logs, and monitor resources on them. Create filters based on device attributes, allowing groups of devices to be targeted for firmware updates etc.*

## Firmware Management
*Users can upload firmware, along with the manifest that describes how the update will be applied. They can then trigger the firmware update campaign.*

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# Objectives for the week

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# Objectives for the week

## Hardware Security

- mbed OS 5.4 includes APIs for partners to add hardware security support

- We will work on:
  - Software and hardware entropy sources
  - Hardware cryptographic acceleration
  - How to contribute

→ *Enables optimal security capabilities and performance available on your platforms*

## Services Infrastructure

- mbed OS 5.4 introduces components needed for device management services

- We will work on:
  - Flash algorithms for image installation
  - Put in place first bootloader
  - Enabling storage subsystems

→ *Enables out-of-the-box support for mbed Cloud services on your platforms*

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# mbed OS 2017 Release Schedule
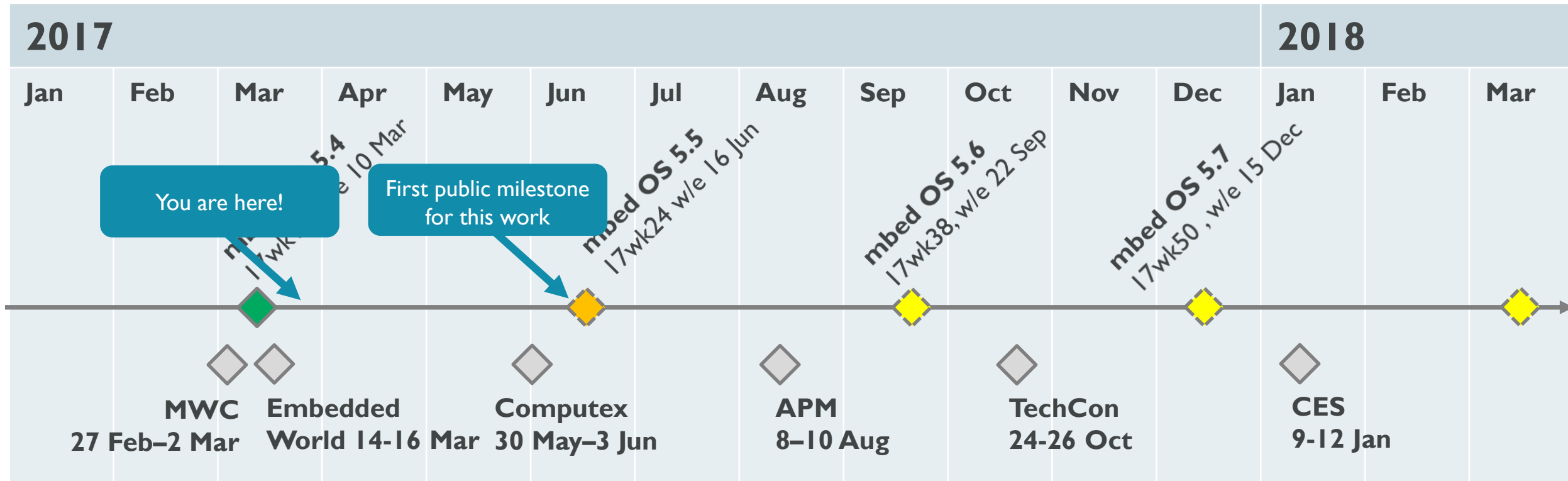


- Main releases scheduled approximately every 3 months
- Patch release train every 2 weeks (picks up Bug fixes and Partner target support)

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# Meet the team

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# Key go-to people this week

**Sam Taylor**
Engineering Manager

**Simon Ford**
Product Management

**Sam Grove**
Technical Lead

**Mihail Stoyanov**
Partner Enablement Lead

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# Format for the week

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| | Monday, Mar 27 | Tuesday, Mar 28 | Wednesday, Mar 29 | Thursday, Mar 30 | Friday, Mar 31 |
|---|---|---|---|---|---|
| 7-9am | | Breakfast | Breakfast | Breakfast | Breakfast |
| 9am | | mbed TLS Architecture | Adding HW Acceleration to mbed TLS | mbed OS Engineering Roadmap | |
| 10am | | Adding Entropy to mbed TLS<br>Possible entropy sources<br>Software Interface<br>NV Seed | Software Interface<br>Symmetric (AES) &<br>Asymmetric (ECC) | Additional Requirements for Contributing Security Code | Optional Hands-on Development Time |
| 11am | | Hands-on<br>Development Time | Hands-on<br>Development Time | Hands-on<br>Development Time | |
| 12pm | | | | | |
| 1pm | | Lunch | Lunch | Lunch | Lunch |
| 2pm | | Adding Bootloader Support<br>Flash API, Flash Algos, Runtime | Adding Storage Support<br>Block Storage API<br>NOR Flash, Filesystem | Best Practices for Writing Security Code | |
| 3pm | | | | | |
| 4pm | | Hands-on<br>Development Time | Hands-on<br>Development Time | Hands-on<br>Development Time | |
| 5pm | | Show & Tell, QnA | Show & Tell, QnA | Show & Tell, QnA | |
| 6pm | Objectives for the week | Break | Break | Workshop Review and Next Steps | |
| 7pm | Dinner | Dinner | Dinner | Dinner | |
| 8pm | | | | | |
| 9pm | | Optional Hands-on Development Time | Optional Hands-on Development Time | Optional Hands-on Development Time | |

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# Workshop Materials & Presentations

- Workshop materials at https://github.com/ARMmbed/mbed-os-workshop-17q2
- Also slides will be shared just after they are presented.

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# Final Logistics

- Fire exits

- Toilets

- Garden

- Tonight
  - Dinner @ 7pm in the "Robinson Room"
  - This room ("Exec Conf 2") is open after dinner for any setup you may want to do

- Tomorrow
  - Breakfast served 7-9am in the "Executive Restaurant"
  - In here for 9am start!

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# Have a great week!

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