

# mbed Cloud



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# IoT landscape and networks are constantly evolving

## Secure smarter city applications

Cellular and NB-IoT support for faster, more efficient operations



## Precision farming and connected sites

Native LoRaWAN API support to allow for rapid software development

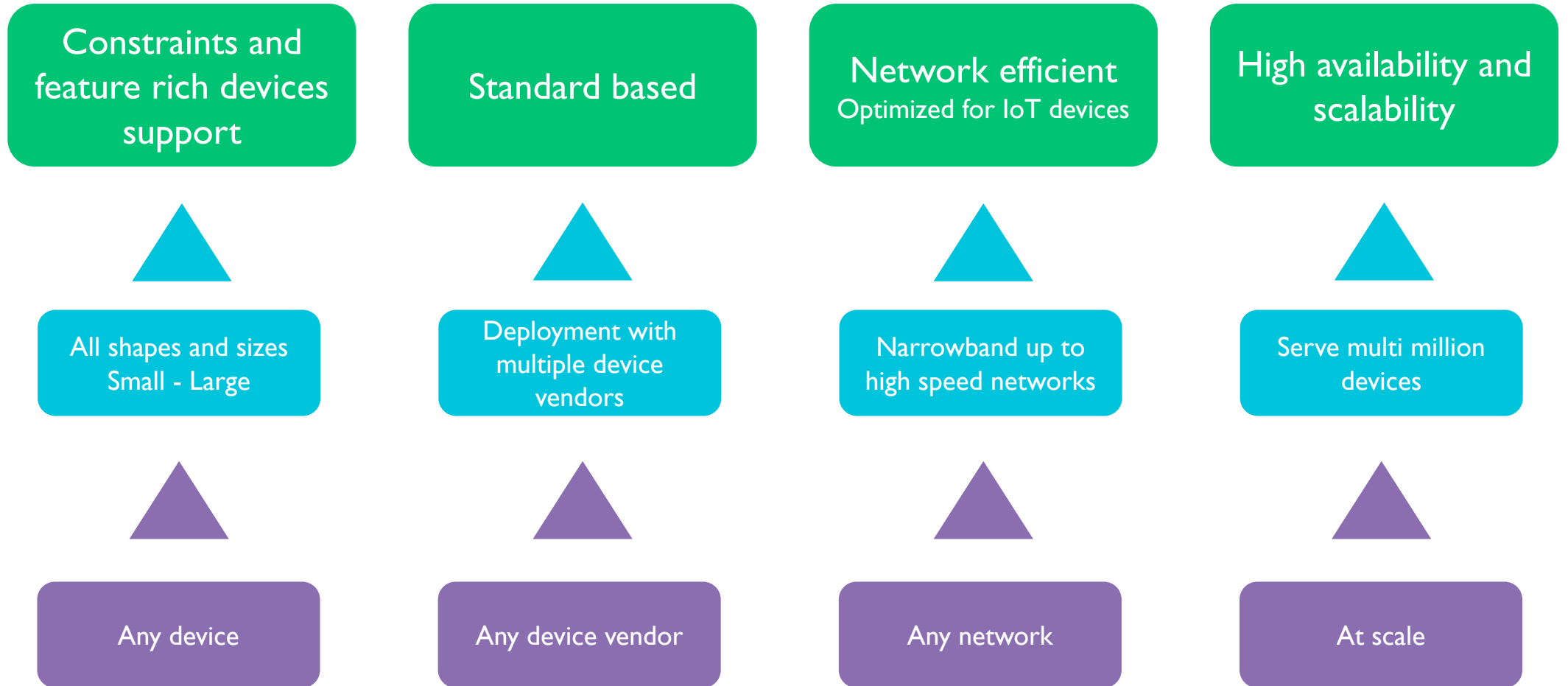


## Commercial lighting control

Certified Thread I.I stack by ARM mbed is being adopted by major manufacturers



# IoT challenges

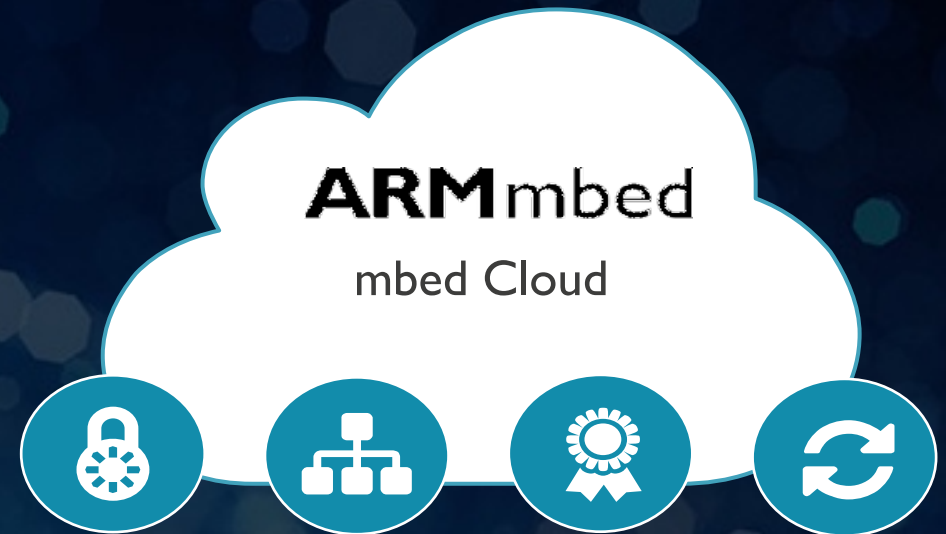




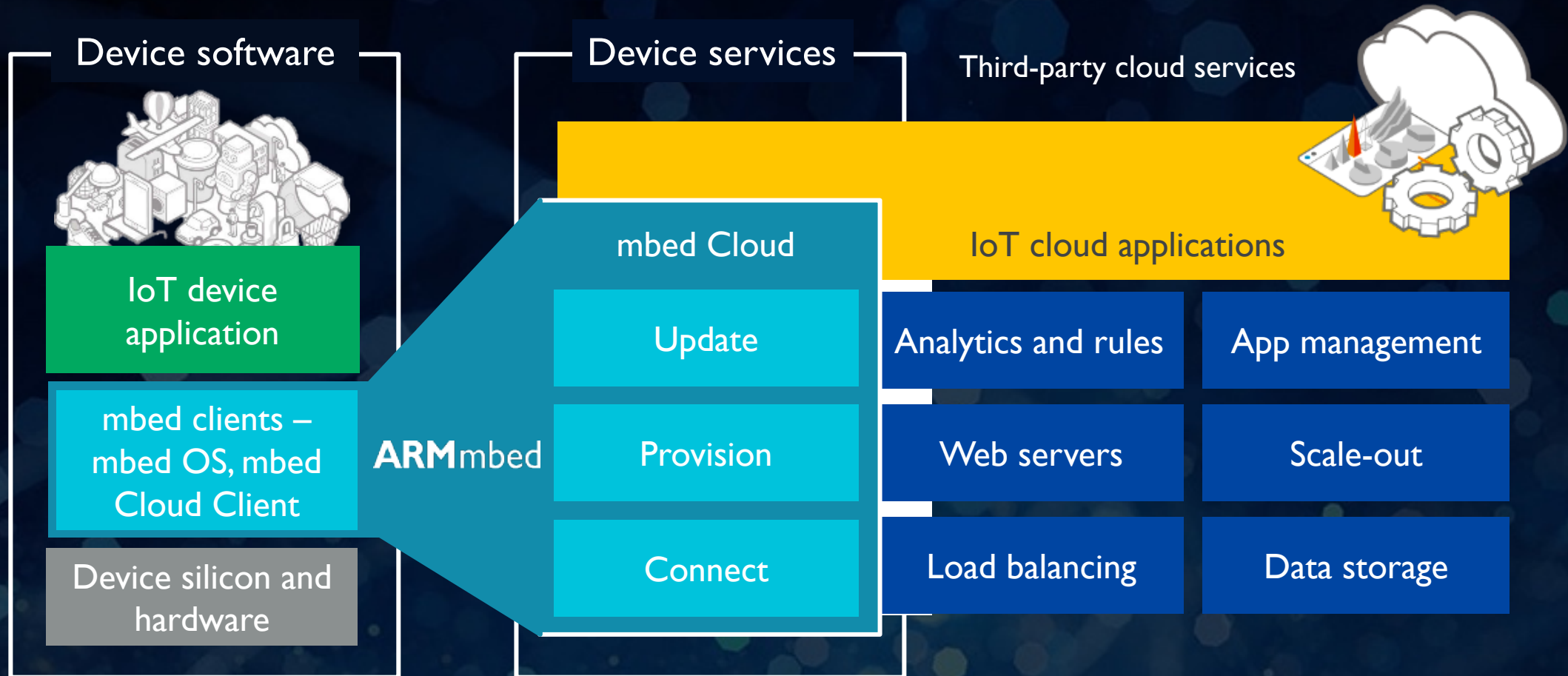
# How to fast-track your IoT?

mbed Cloud simplifies connecting highly-constrained and IoT-ready devices and offers end-to-end security

- Standards-based approach
- Optimized for energy efficiency
- Unique offering for a chain of trust for IoT
- Simplifies firmware update across complex networks



# Connecting chip to cloud



# Accelerate time-to-value with SaaS

Standards  
based



Modular  
approach



Automatic  
upgrades



Speeds  
integrations



Easy integration and  
expansion as technology  
matures

Configurable - buy  
what you need

Seamless experience  
for latest features

API-first developer  
tools for high  
productivity

# Example of weather station



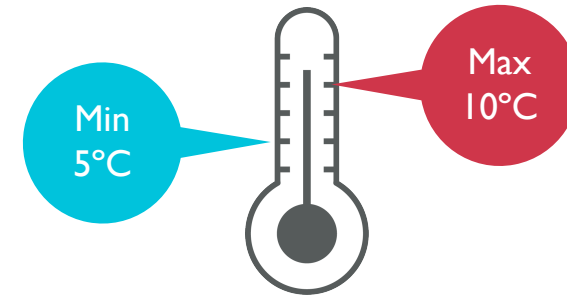
- Device registers
- Registration lifetime: 24h
- Discover objects & resources:
  - Power switch
  - Temperature
  - Humidity
  - Pressure

## Simple observation



- Observe temperature
  - GET /sensors/temperature Observe
- Device notifies everytime a change of temperature happens
  - Notify 14.5C
  - Notify 13C

## Observation with attributes



- Write attributes
  - Minimum value 5C and Maximum value 10C
  - Write Attributes PUT /sensors/temperature?tmin=5&tmax=10
- Observe using attributes
  - Notifications are not sent unless temperature goes below 5C or above 10C

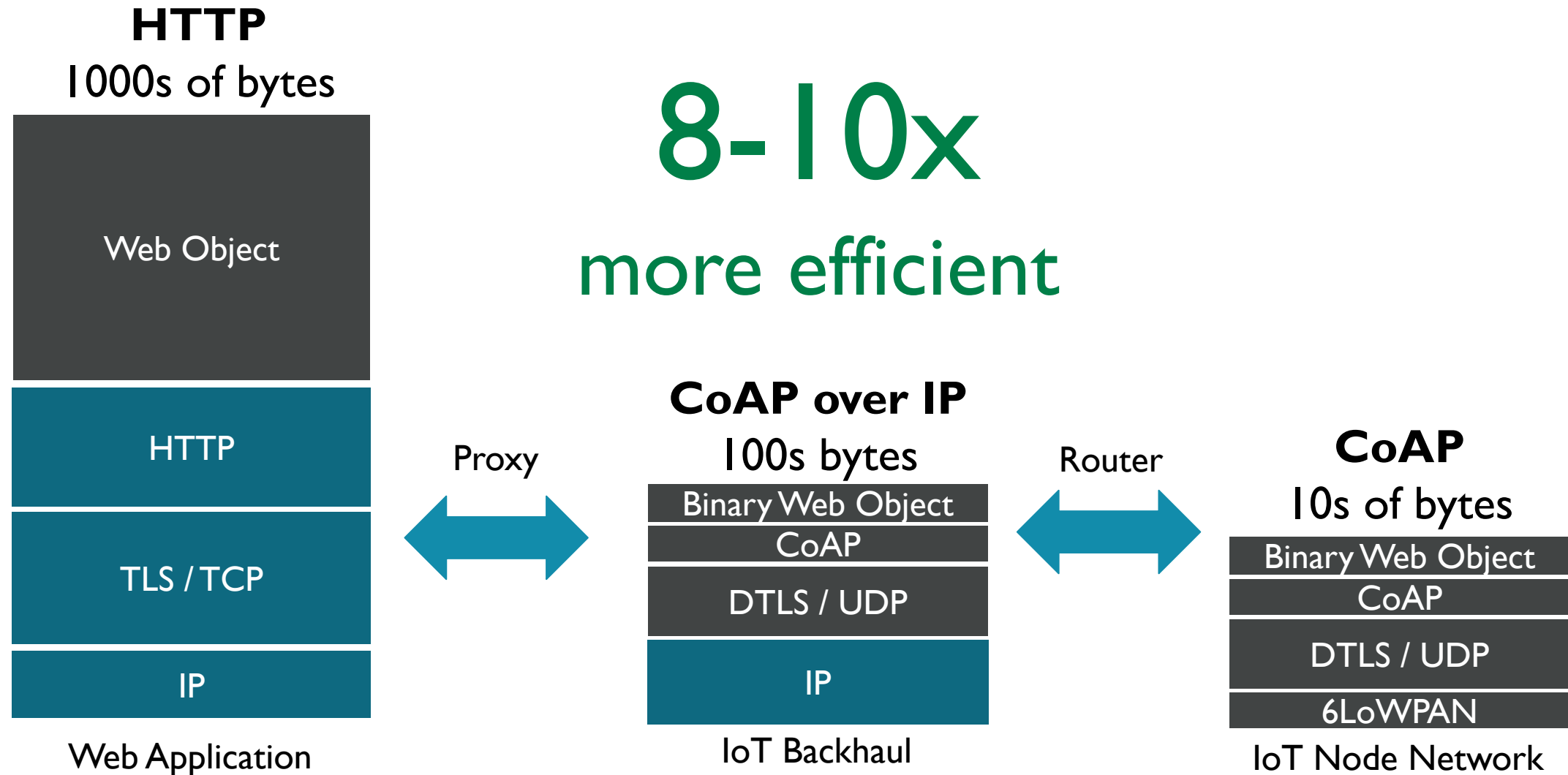
# OMA Lightweight M2M



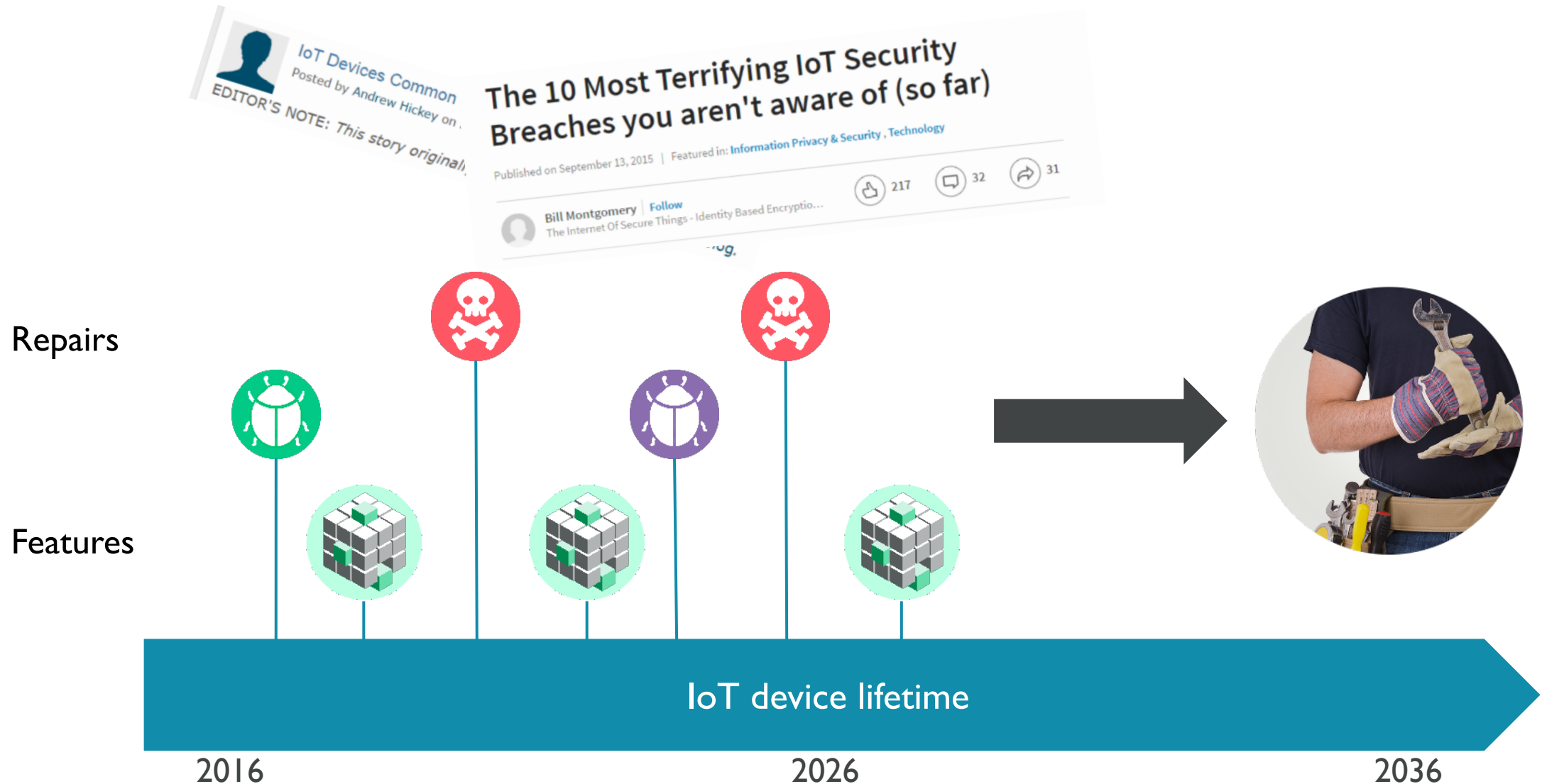
- LWM2M is a Device Management protocols optimized for IoT devices
  - Manage IoT devices remotely and update over-the-air
- LWM2M enables interworking between compatible clients and servers
- Usage of Standard protocols is the key in preventing vendor lock-in
  - Vendor lock-in - a customer dependent on a vendor for products and services, unable to use another vendor without substantial switching costs
- ARM is an active member in the OMA standard body activities
- ARM client and server implementation are standard compliant
  - ARM participate in the on-going TestFests computability activities



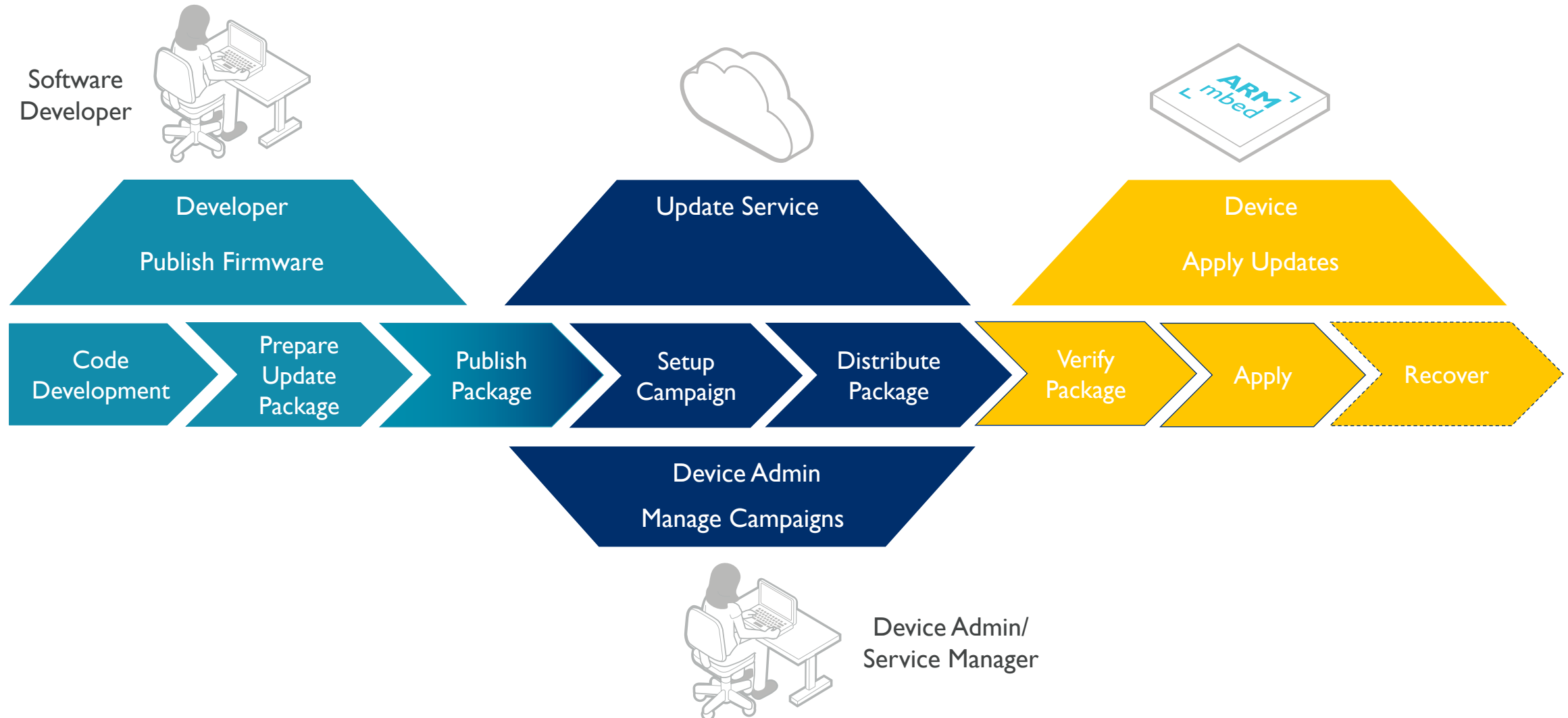
# Network efficient - from web app to IoT nodes



# New features and repairs are expected



# Update Workflow using mbed Cloud



# mbled Cloud – Engaged Customers

mbled Cloud is available for enterprise licensing for businesses taking their IoT to scale.



Globally recognized leaders in their segments are using mbed Cloud for their IoT.



# Proven at scale across diverse markets



“Utilizing mbed Cloud will bolster enterprises’ ability to migrate from M2M and other proprietary devices to IoT as well as enable developers to deliver enterprise-class solutions.”

Tom Bianculli, Chief Technology Officer,  
Zebra Technologies.



Time to critical medical treatment  
IoT solutions for healthcare





# Proven at scale across diverse markets



- Deployed in smart street lighting solutions since 2014.
- \$250,000 annual savings in San Diego from 100,000 nodes deployed.
- Reduced OpEx and improved citizen safety.
- Deployed throughout USA and South America.

# Any device

**mbed Cloud Client**  
Flexible

**OEM specific needs**  
Supporting ARM and other architectures



**Ecosystem collaborations**  
mbed Cloud Client and mbed OS

**Cortex-M and Cortex-A based**  
Influencing security fundamentals for IoT



**mbed OS**  
Strongest security end-to-end

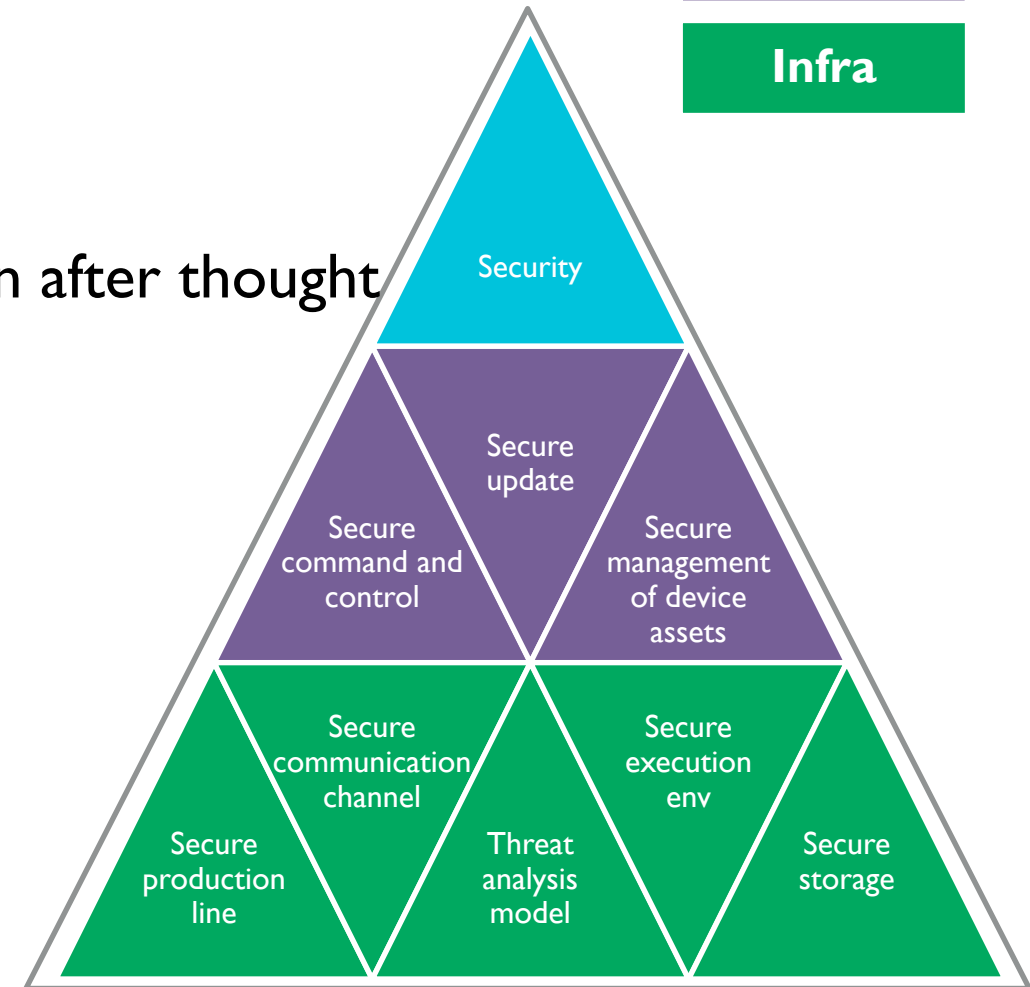
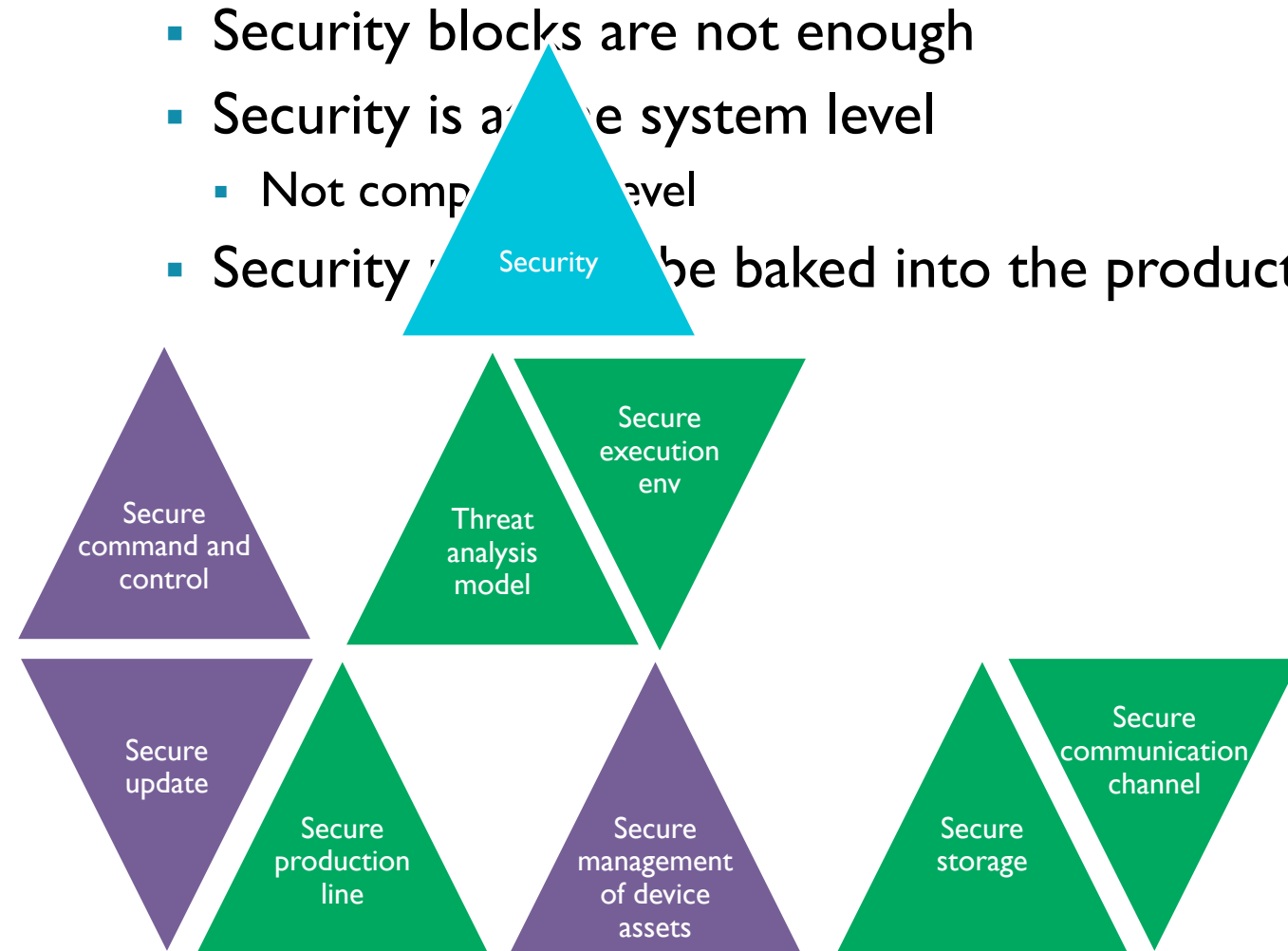
**Cortex-M based**  
Highest growth connected devices



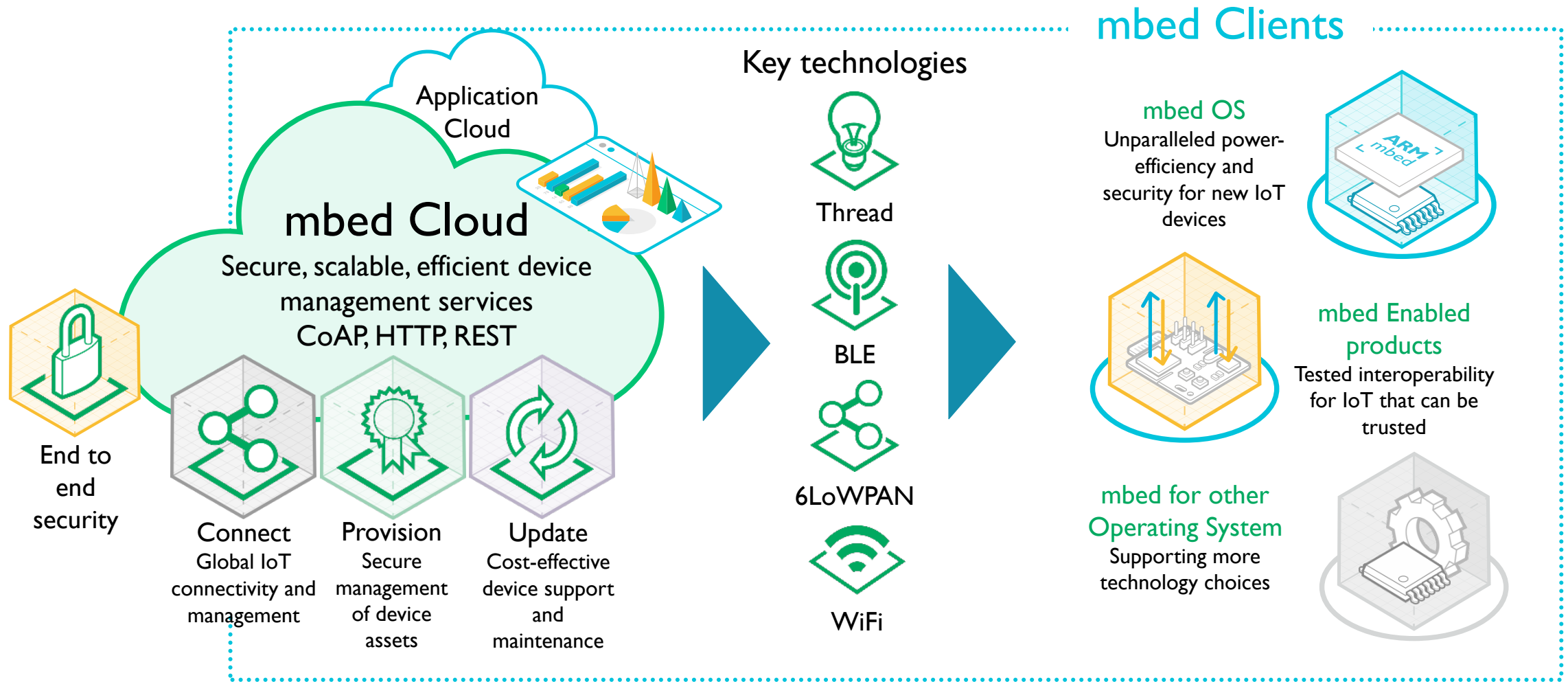


# Secure device management

- Security blocks are not enough
- Security is a **system level**
  - Not complete level
- Security **must** be baked into the product not an after thought



# ARM mbed: Bridging IoT cloud and device security



# ARM

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