2015

Global Azure

BOOTCAMP

Azure & Embedded

Thierry JOUBERT, C.T.O.
THEORIS

e101
embedded101

AGENDA

- Azure Mobile Services

- Embedded challenges

DOWNSIZING

1980
$300 000

1990
$30 000

2000
$3 000

2010
$300

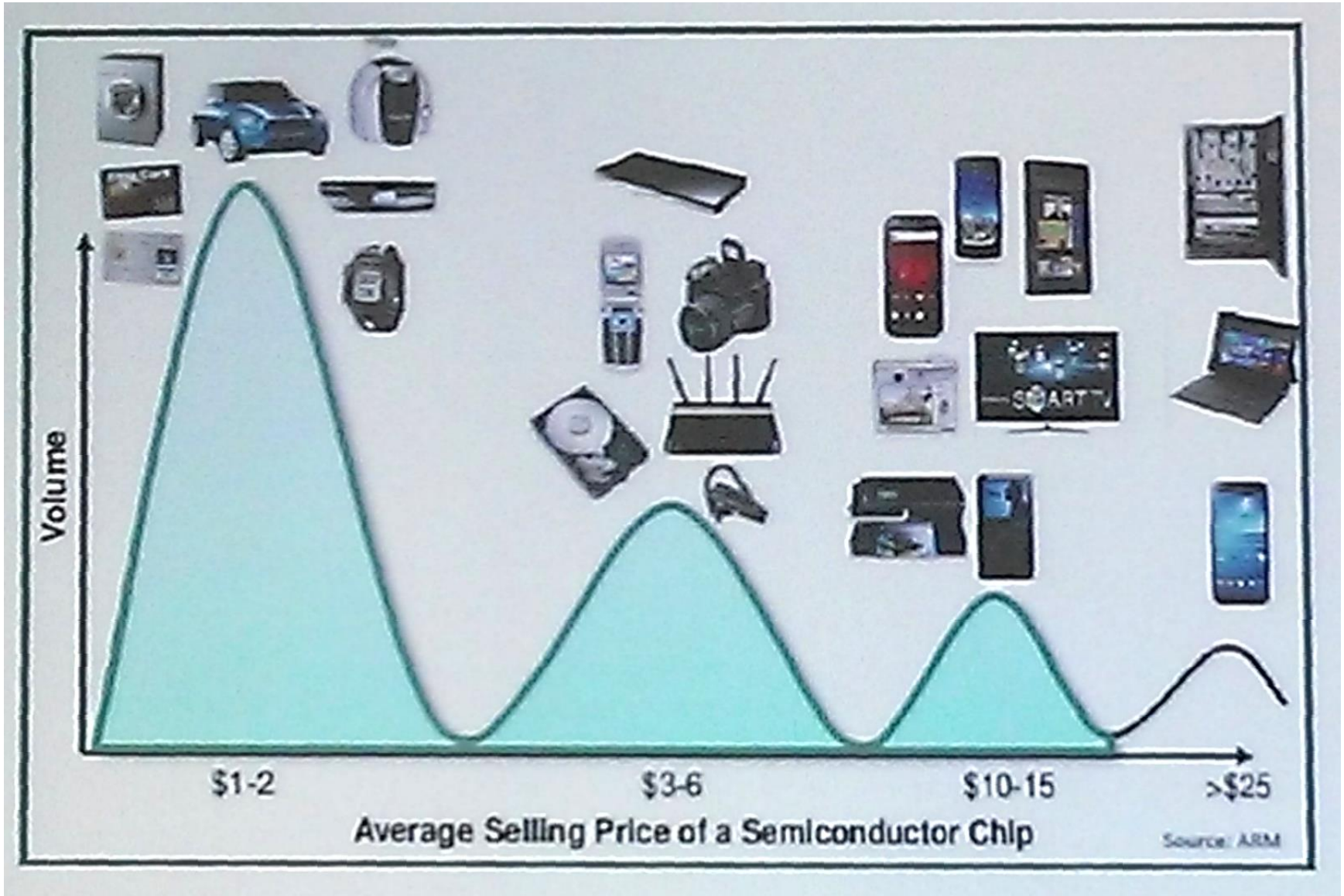
2015
$30

NOTHING NEW …?

1980

2015

COST IMPACT



LOW COST HARDWARE

- New solutions every week !
  - Raspberry PI
  - Arduino
  - Galileo1, Galileo2
  - 86Duino
  - Freescale
  - NXP
  - NetDuino
  - Weio
  - Intel Edison
  - Etc…







WIRELESS + WEB

- Mobile networks
  - Broad access
  - Quick deployment
  - Flexibility

- Datacenters
  - Security
  - Services

CONNECTION PARADIGM SHIFT

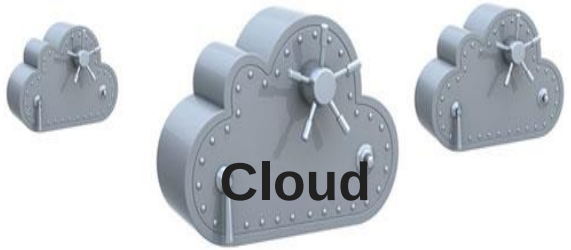
1990

CORBA
COM+

2000

HTTP
PHP

2010



SOAP
REST

ABOUT SERVICES

- Connectivity

+

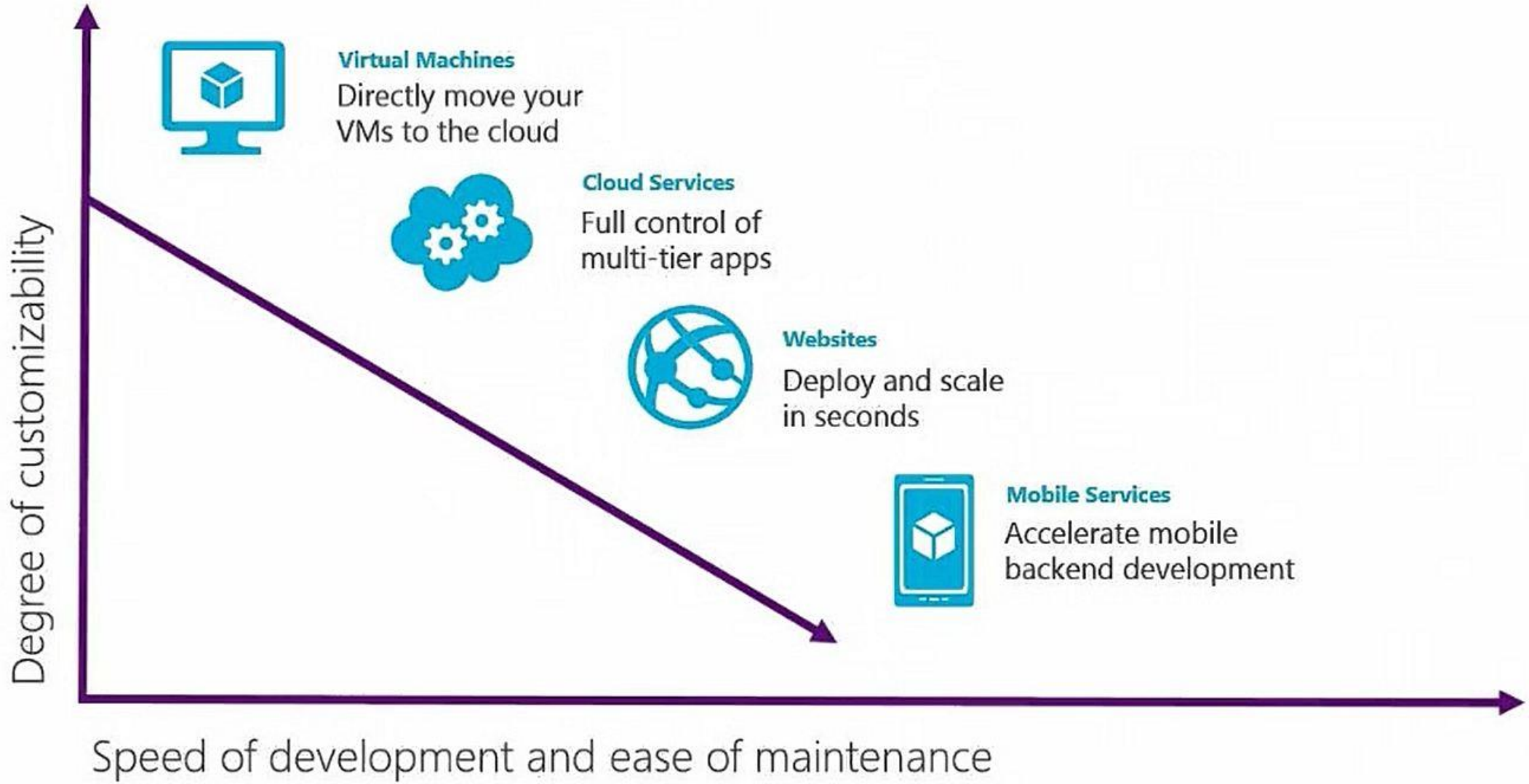
- Localisation

+

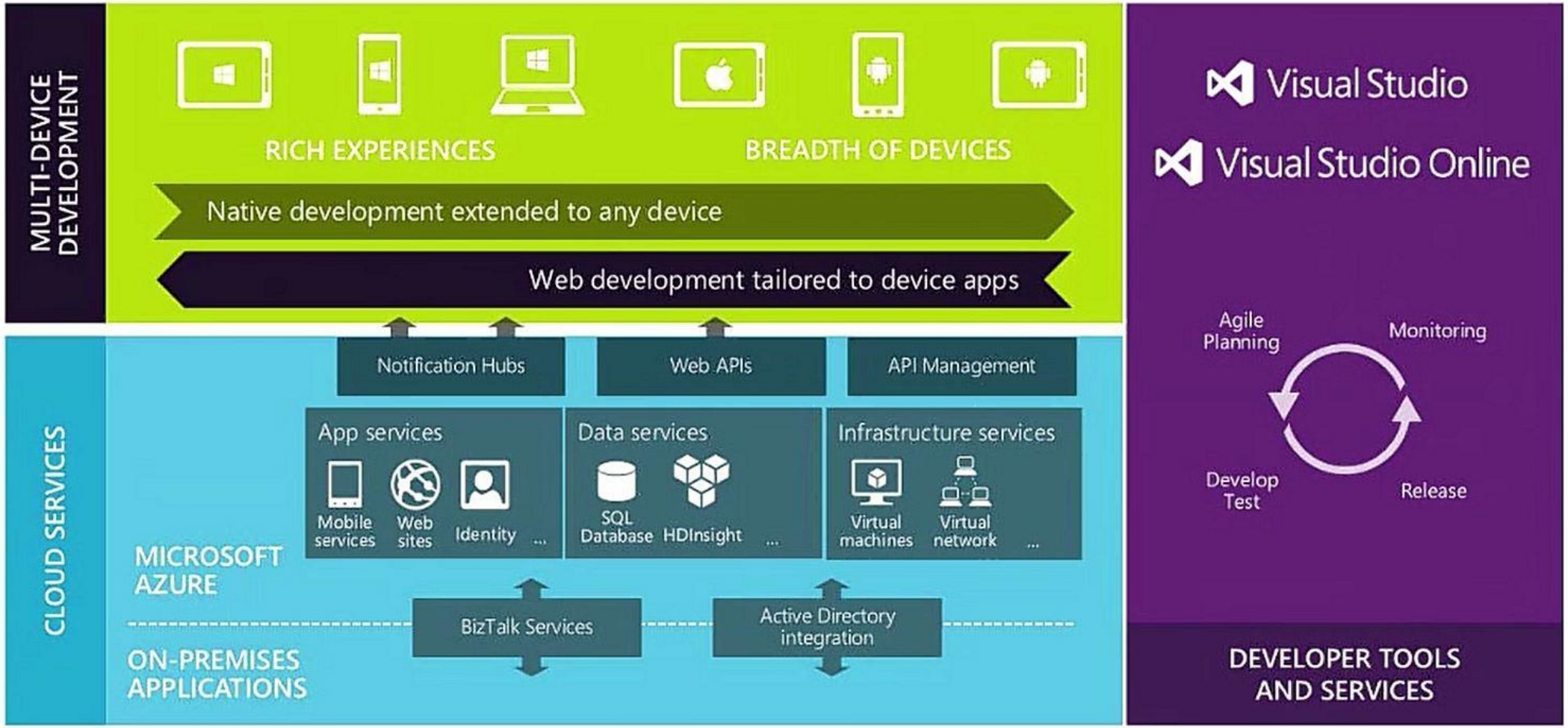
- Sensors

= Services

AZURE SERVICES



SOLUTION FOR MOBILE

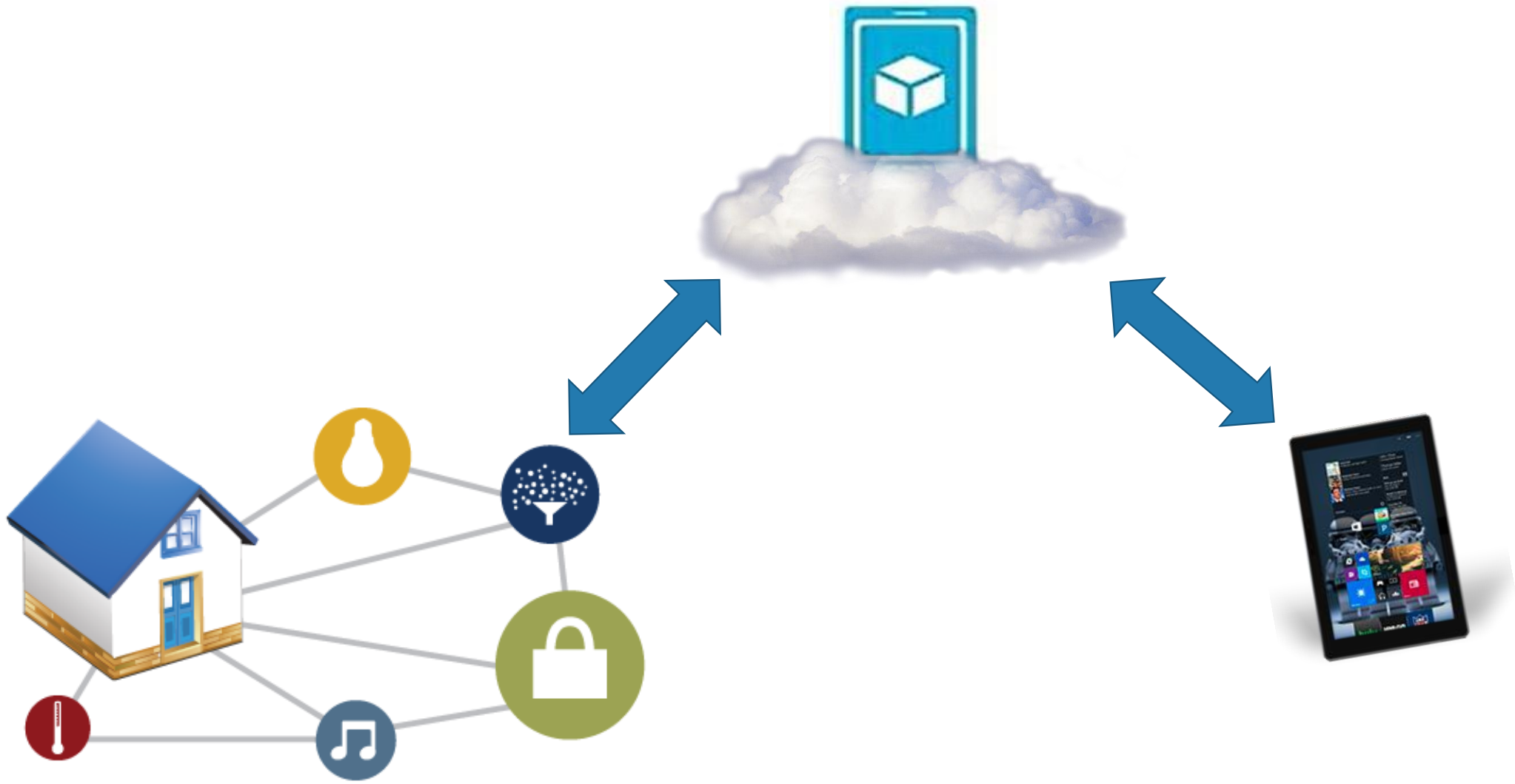


AZURE MOBILE SERVICES

1. Provide a back end to an app running on any device.
2. Store your data in the cloud or offline.
3. Authenticate users using Facebook Twitter, Microsoft Account, or Active Directory.
4. Built-in support for cross-platform push notifications.

SERVICES & TOOLS

AZURE & SMART HOME

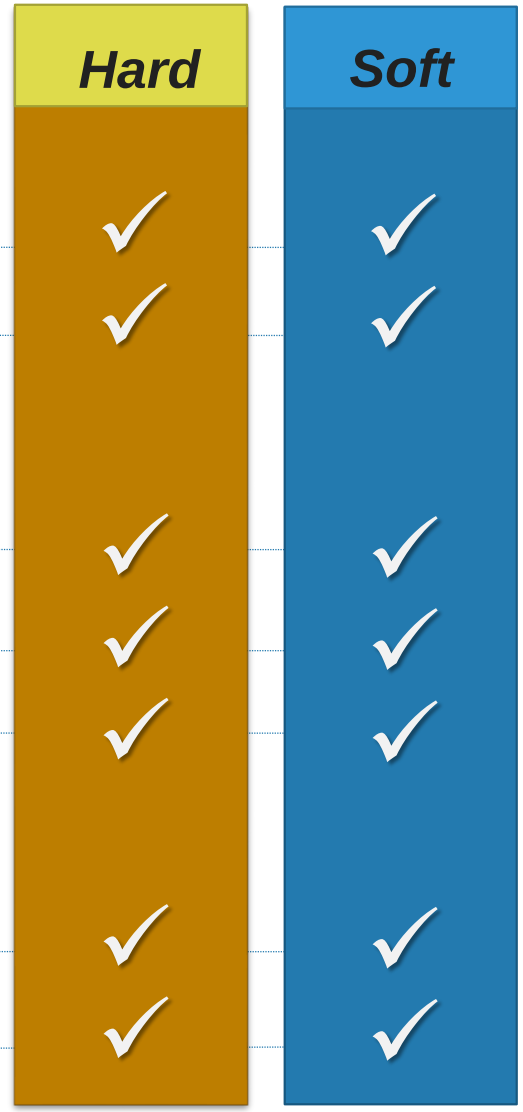


SMART HOME LAYERS

Embedded Devices

WHAT IS EMBEDDED ?

- Robustness
  - Cannot stop or Re-boot
  - Difficult to update
- Performance & resources
  - Determinism
  - Low energy
  - Limited CPU & memory
- Cost & Delays
  - Strong delivery constraints
  - "Hidden" = low cost



EMBEDDED PROJECT

- Hardware

Eval Board → Prototype → Final

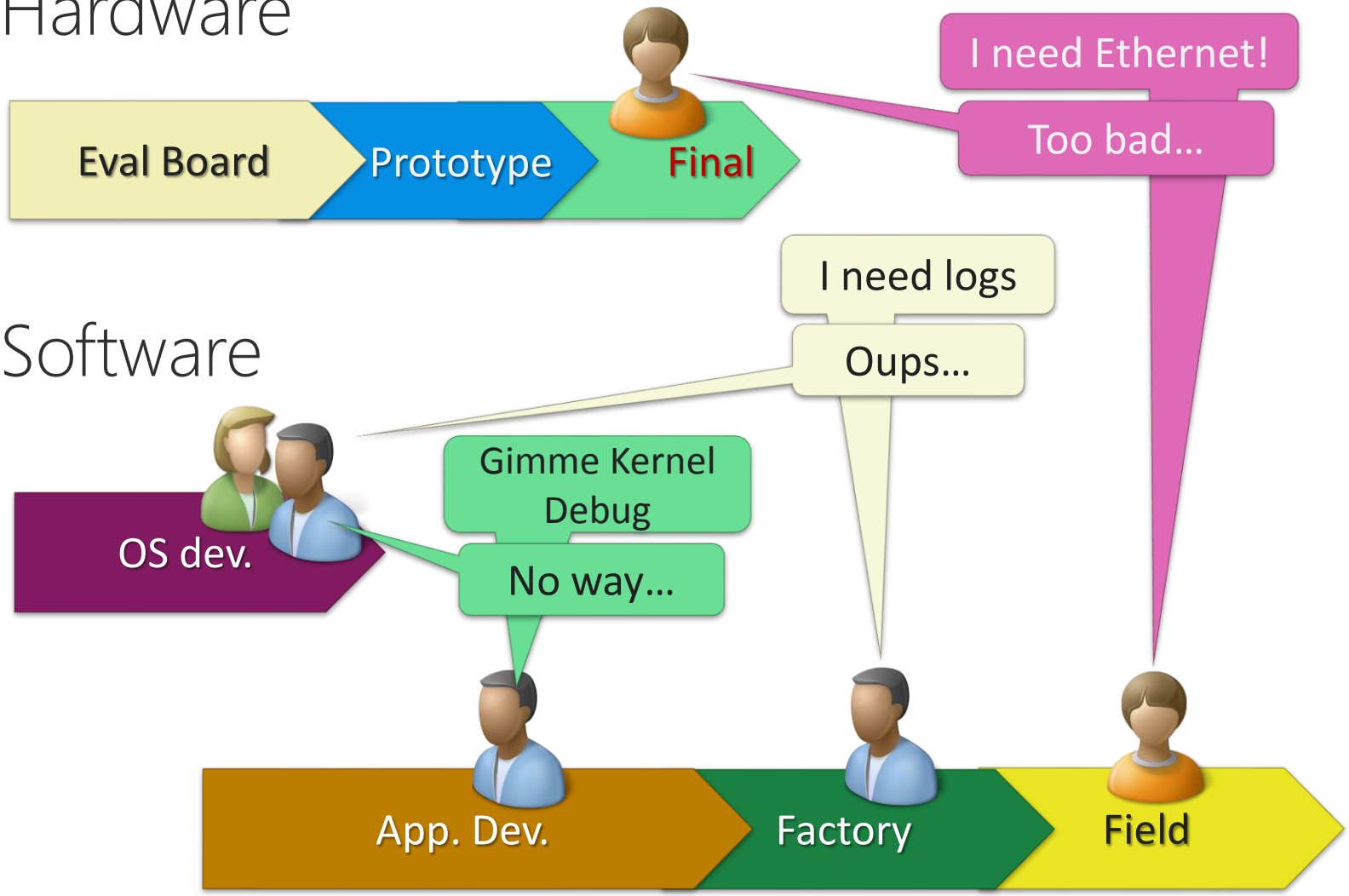
- Software

OS Development → Application Development → Factory Tests → Field Tests → Ship!

High Level
of parellism
→ **High pressure**

DEPENDENCIES & TOOLS

- Hardware
- Software



EMBEDDED OS & FRAMEWORKS

- In the early days everything was C/ASM
  - 8bits – 16bits machines
  - Memory counts in Ko
  - Performance/cost optimisation

- Good News! This is *almost* over
- Embedded OS + Frameworks
  - Resources abstraction
  - Tools & Simulation

e101
embedded101

EMBEDDED FRAMEWORKS

- .NET micro framework
  - Visual Studio
  - Open Source

- MicroEJ framework
  - Eclipse
  - Java and C/C++
  - Flexibility

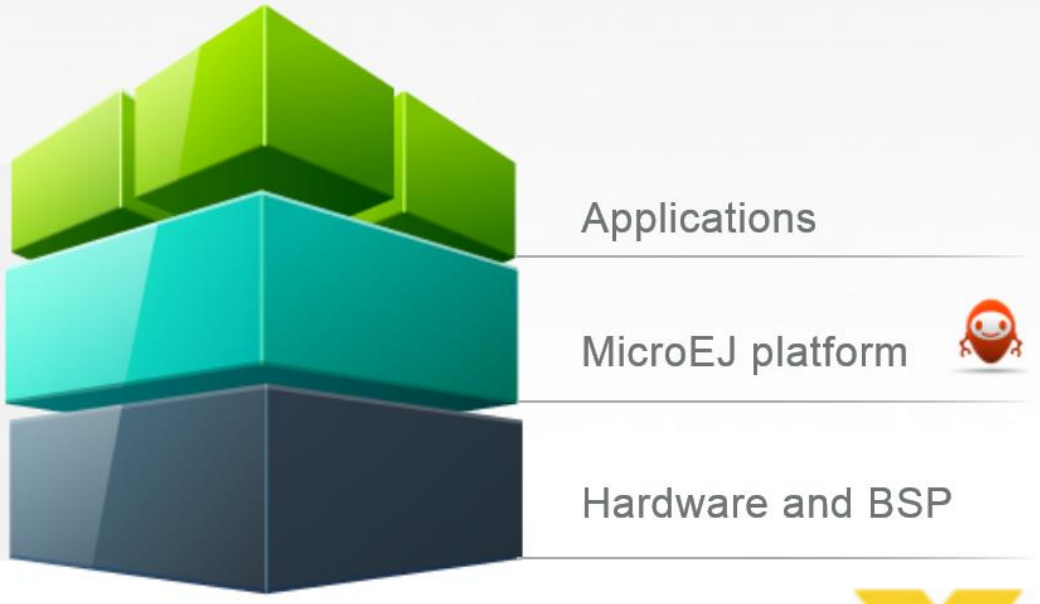
MICROEJ

MICROEJ SOLUTION

iOS

MICROEJ®

Manage your apps
on low-resource hardware



Green Hills SOFTWARE

freeRTOS

KEIL An ARM® Company

Micriμm

ThreadX

RENESAS

NXP

freescale

e101 embedded101

USE CASES

MicroEJ
Development tool

Multi-Platform

Simulation

Bare Metal

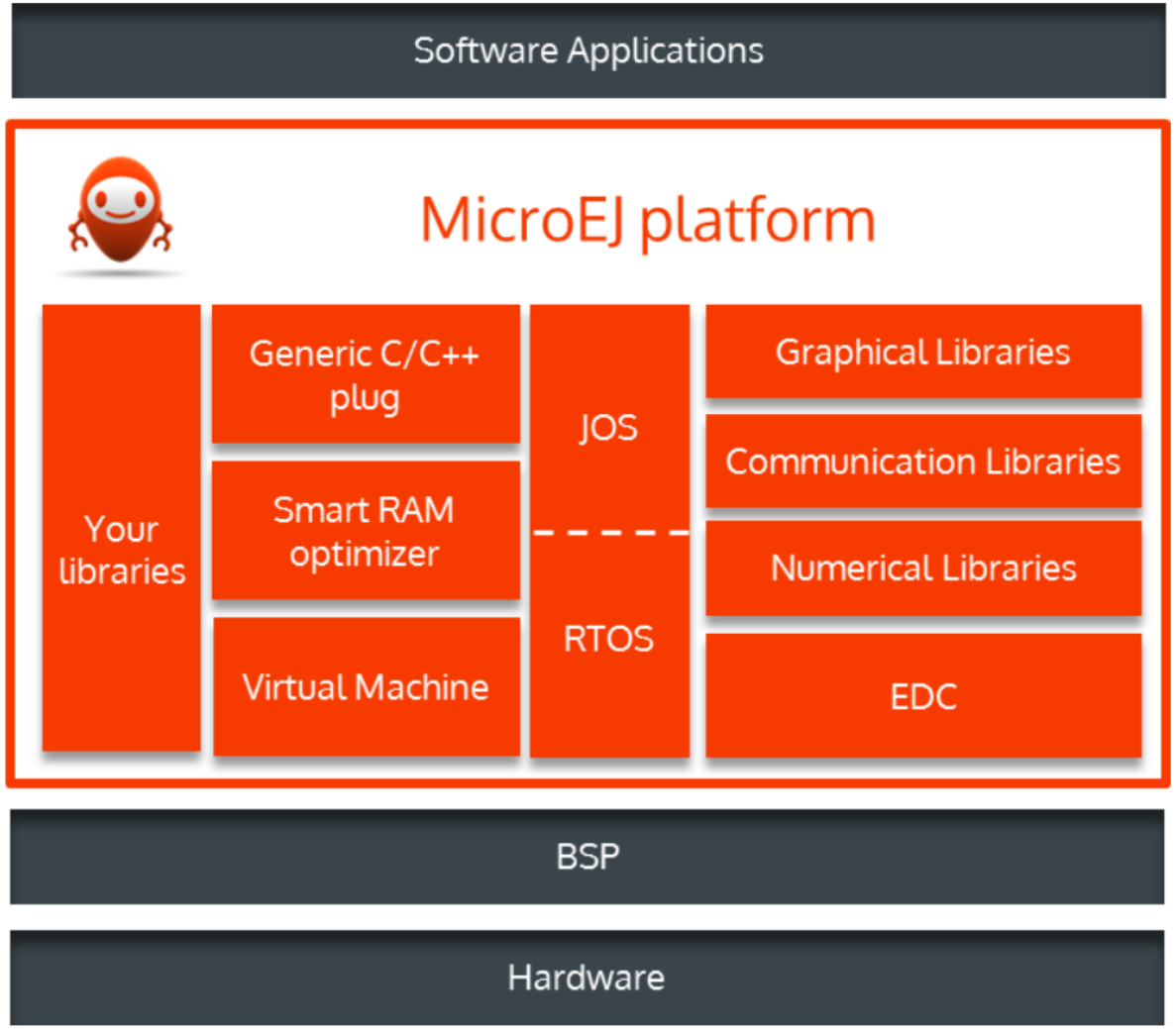
MICROEJ ARCHITECTURE

MWT
MicroUI

MicroJvm
- 28K Flash
- 1,5K Ram
- C Interface

Shielded Plug
B-ON
SNI

Drivers (OAL)
- Display
- Input
- Etc.

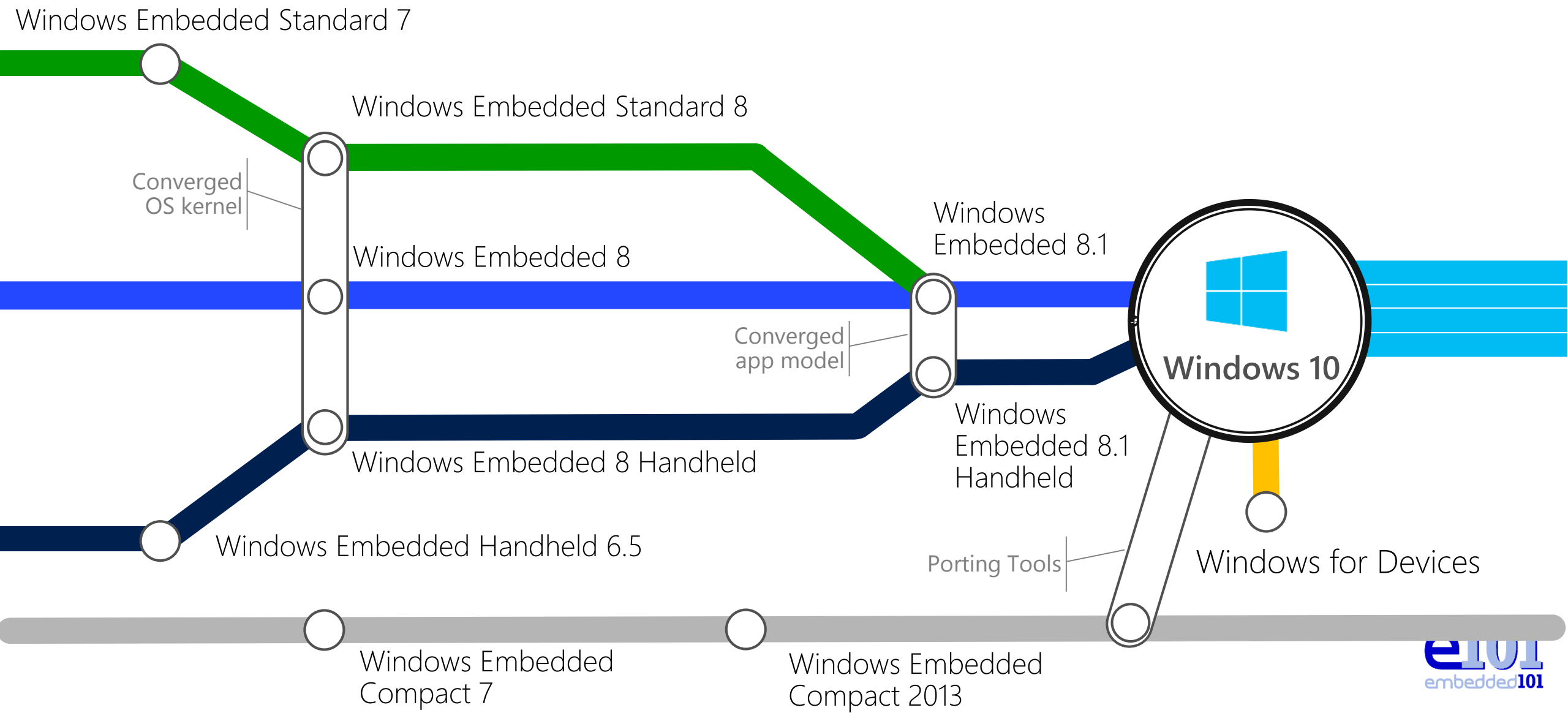


EMBEDDED OS

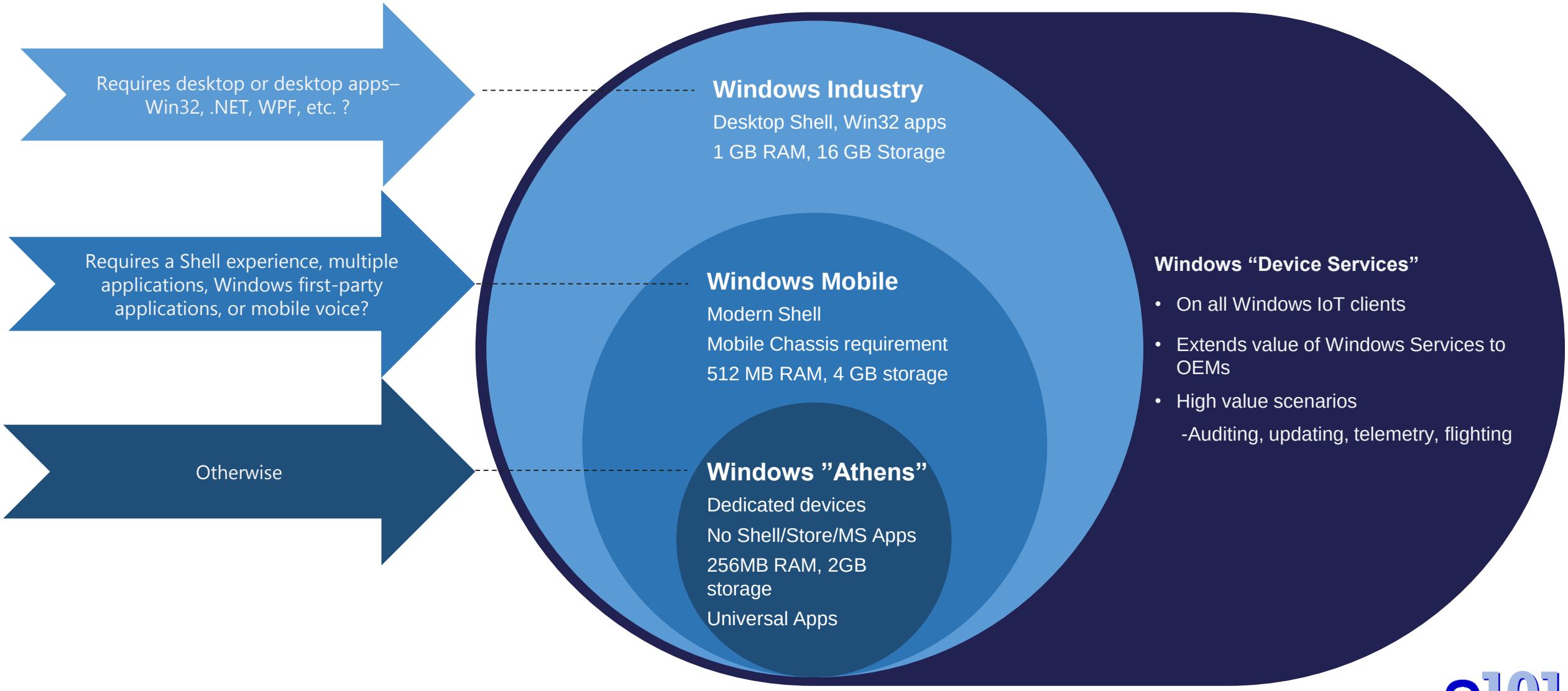
- .Windows Embedded Compact
  - Visual Studio
  - Kernel & driver Sources available

- Windows 10
  - Visual Studio
  - OS components
  - Flexibility

PLATFORM CONVERGENCE JOURNEY

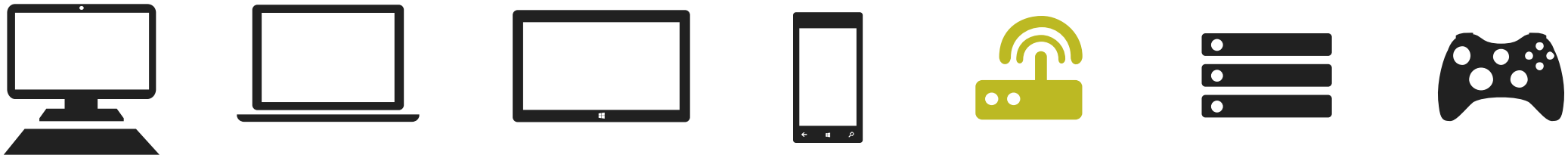


WINDOWS 10 IOT EDITIONS



WINDOWS UNIVERSAL DRIVER PLATFORM

- Write **ONE** Universal Driver and target all Windows 10 editions - **Converged** device areas/APIs

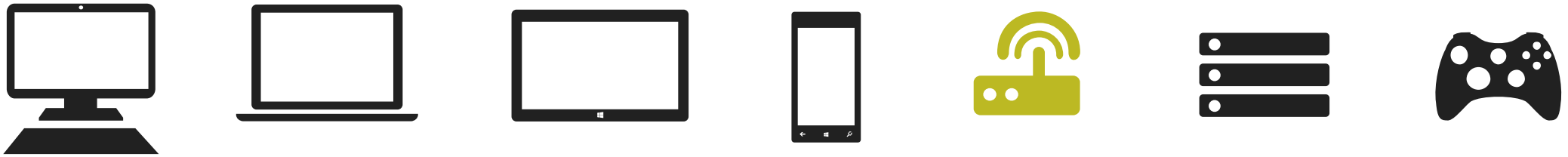


Windows Universal Platform
Common & Consistent Device Driver APIs

WDF	Location	NFC
Audio	Networking - Wired	Sensors
Bluetooth	Networking - WLAN	Thermal
Buses (USB, SPB)	Security - Biometrics	Touch
HID(Retail), Buttons	Security - Crypto	UEFI
Camera	Security - Smartcard	Video
Graphics & Display	Security - TPM	

WINDOWS UNIVERSAL APP PLATFORM

- Converged APIs, write ONE Universal App and target all Windows 10 editions



Windows Universal Platform
Common & Consistent APIs

Languages
- C++ /CX
- C#, VB
- JS
- Python
- Node.js

UI Frameworks
- HTML
- Xaml
- DirectX

APIs
- WinRT
- Win32
- .NET
- Wiring

Deployment and Execution
- APPX
- Xcopy
- App Isolation

Tools
- Visual Studio
- PowerShell

Windows | Dev Center

Search Dev Center with Bing

Sign in

Call to action

Windows Developer Program for IoT

We're bringing Windows to a new class of small devices.

What will you make?

Get started

Register to be a Windows IoT Developer today

THANK YOU

Q & A