Microsoft

Create Industry Devices with Windows 10 IoT

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Windows IoT Overview
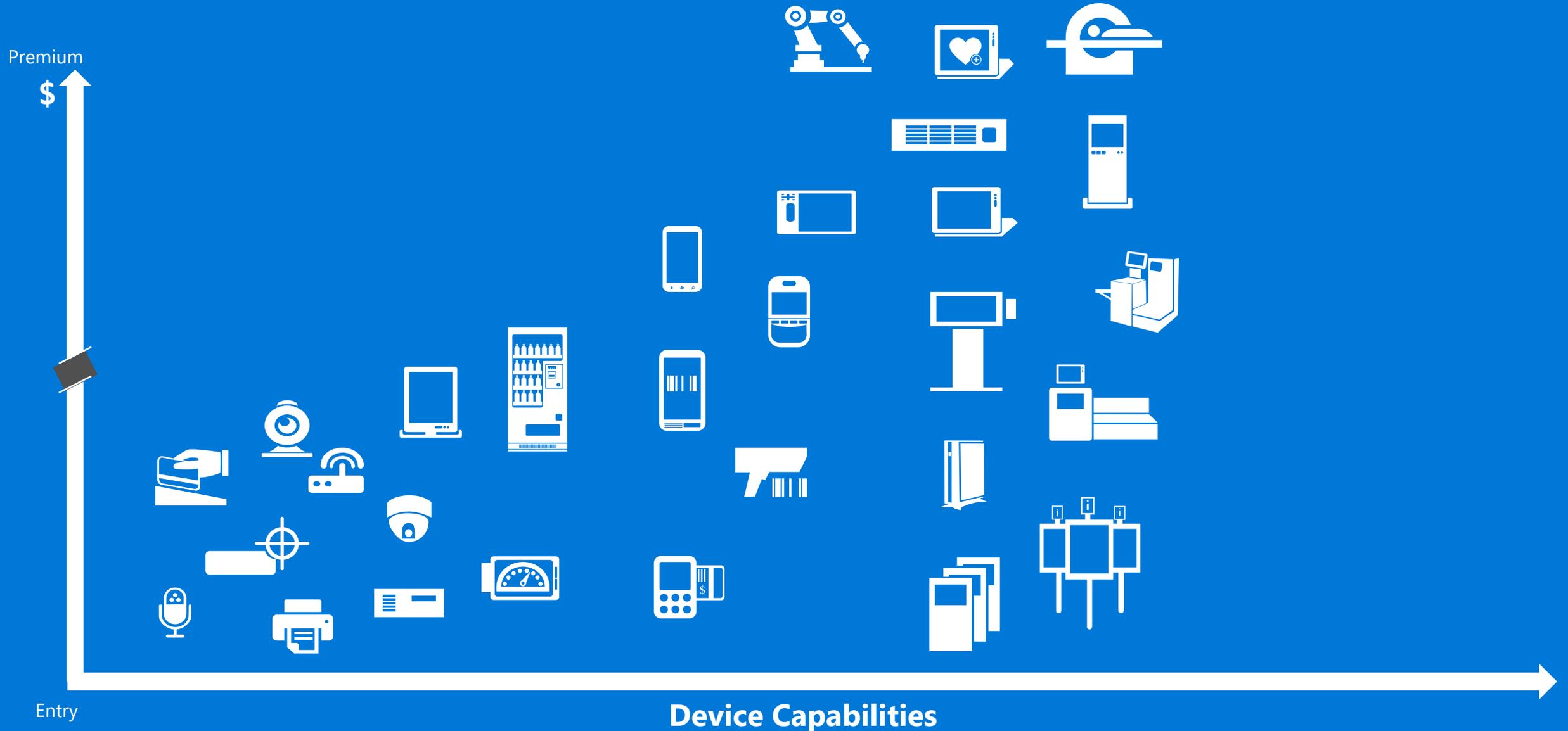
Window 10 IoT

Windows 10 IoT Enterprise [same as Windows 10 Enterprise LTSB]

Desktop Shell, Win32 apps, Universal Windows Apps and Drivers

1 GB RAM, 16 GB Storage

X86
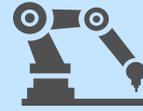
Windows 10 IoT Mobile Enterprise [same as Windows 10 Mobile Enterprise]

Modern Shell, Universal Windows Apps and Drivers

512 MB RAM, 4 GB storage

ARM

Windows 10 IoT Core

No Shell, Universal Windows Apps and Drivers

256MB RAM, 2GB storage

X86 or ARM
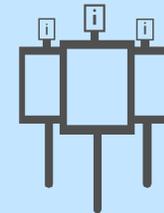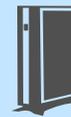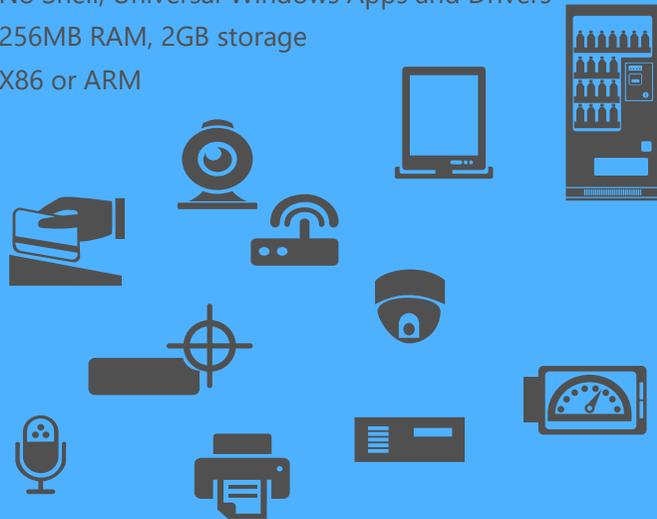
Premium

$

Entry

Device Capabilities

Windows 10 🔒

One Windows Platform

One OS

Universal App Platform

Universal Driver Model

NUI

Deployment & Servicing

IoT Secure

Enterprise-grade security

TPM

Advanced Lockdown

Multi-user Profile

Connected

Industry peripheral support

Interoperability

Azure Services

Scale Your Investments Across All Windows 10 Editions
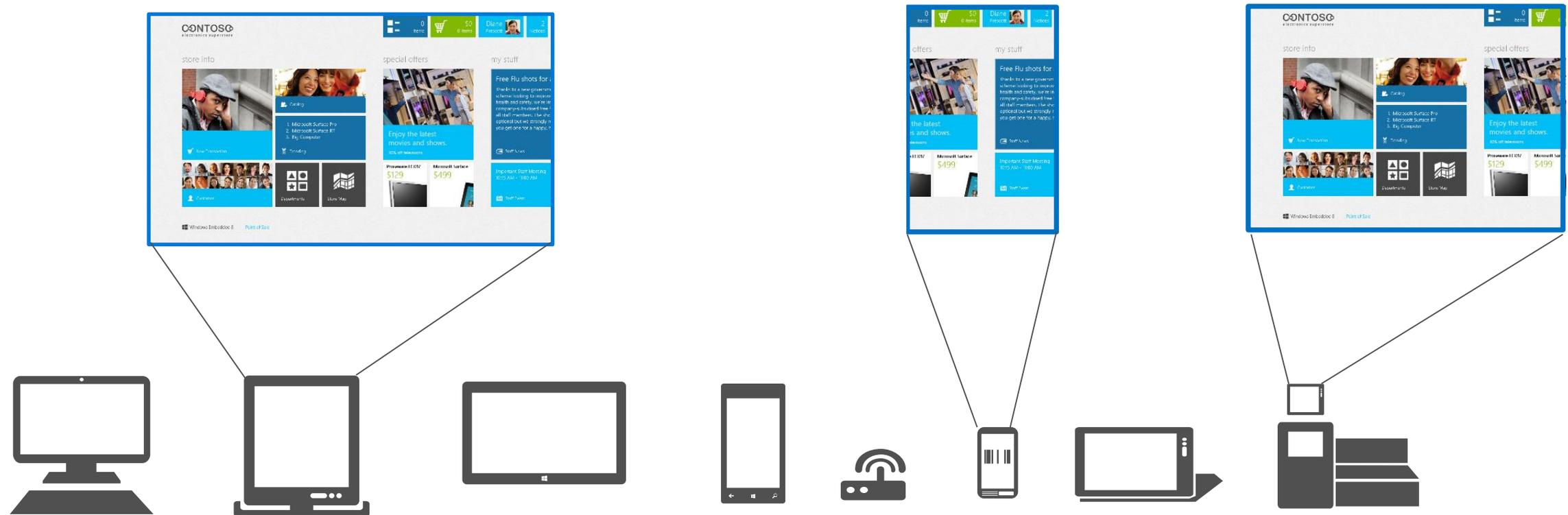
Universal Windows Platform
Common & Consistent APIs

Windows Universal App Platform

- **Converged** APIs, write **ONE** Universal App and target all Windows 10 editions
- **Scale** and get **higher ROI** by selling same App to all Windows 10 editions OEMs/ODMSs
- Reuse **existing development skills**
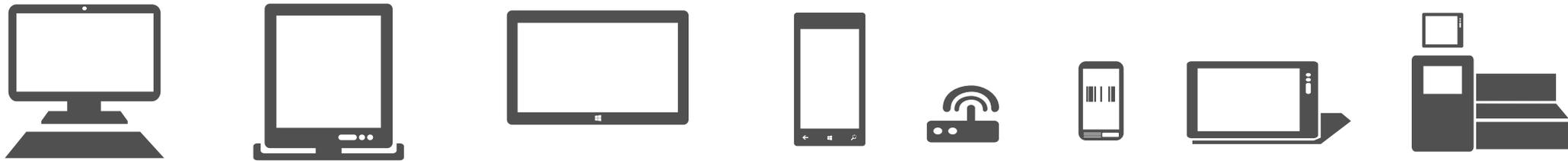
Universal Windows Platform
Common & Consistent APIs

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

UI Frameworks
- HTML
- Xaml
- DirectX

APIs
- WinRT
- Win32
- .NET

Deployment and Execution
- APPX
- App Isolation

Tools
- Visual Studio
- PowerShell
- SSH

Windows Universal Driver Platform

- Write **ONE** Universal Driver and target all Windows 10 editions - Converged device areas/APIs
- **Scale** and get **higher ROI** by selling same components to all Windows 10 editions OEMs/ODMSs
- We scanned over **100k drivers** to create a **universal driver API set**

## Windows Universal Platform
Common & Consistent Device Driver APIs

WDF
Audio
Bluetooth
Buses (USB, SPB)
HID(Retail), Buttons
Camera
Graphics & Display

Location
Networking - Wired
Networking - WLAN
Security - Biometrics
Security - Crypto
Security - Smartcard
**Security - TPM**

NFC
Sensors
Thermal
Touch
UEFI
Video

Configure OS to create your device experience

- Image Configuration Designer (ICD) making it easier for Partners to customize the Device Experience

Provisioning Package

wim / ffu

Image

Windows Imaging and Configuration Designer

Image Configuration Designer

One tool for all your OS configuration needs

Industry Device

Mobile Device

Small Device

1. Customize with Universal Applications, Drivers, Configuration settings

2. Design-in Lockdown settings

3. Customize experience including startup screen

4. Test experience on target device

Consistent Device Management
for all Windows 10 IoT devices

Windows Intune

SC Config Man

3rd Party MDM

OMA DM

Windows 10 IoT

Industry Devices

Mobile Devices

Small Devices
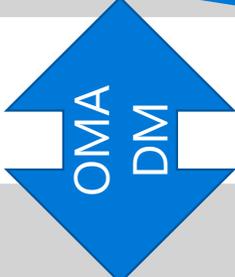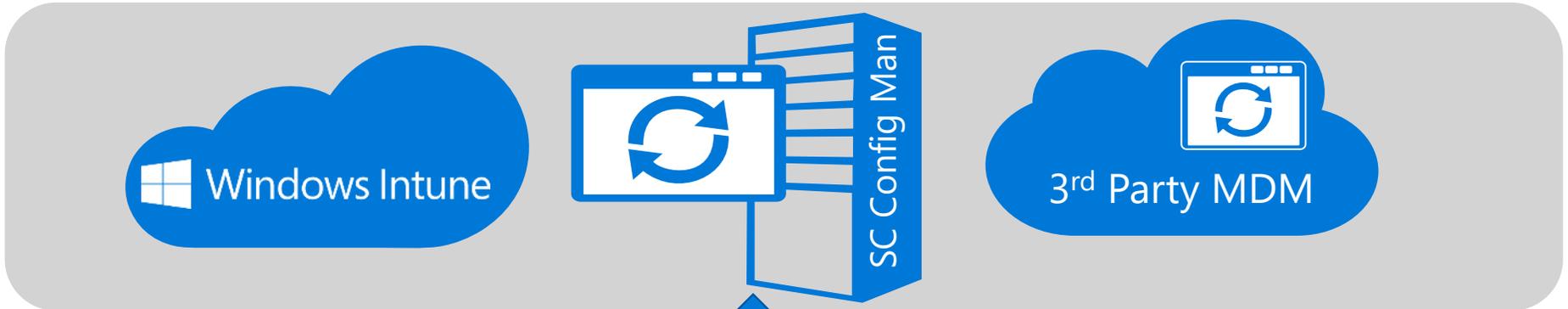
One Windows Platform

- Converged MDM Stack
- Converged Servicing Stack
- Common CSPs

Enterprise Grade Security for Mission Critical Devices

Next Generation Credentials

BitLocker

Device Guard

Securing IoT Devices

TPM Protection

- ## Malware Protection
  "Secure Boot" and enable remote attestation with *"Measured Boot"*

- ## Protect customer data
 BitLocker - Enterprise grade *device encryption and secure key storage*

- ## Resist tampering
  Authenticity with a strong, hardware-bound device identity using Trusted Platform Modules (TPMs)

Win10 IoT TPM Options
- On-Chip
- Firmware
- Discrete (I2C or SPI)
- TPM Simulator-dev tool

Lockdown

- Consistent and predictable device lockdown across form factors

Windows IoT Enterprise and IoT Core

Unified Write Filter

Easily create read only devices. Improve system uptime

USB Access

Only allow approved USB devices

Windows IoT Enterprise and Mobile

Layout Control

Customize the Start Menu layout for special purpose devices

AppLocker

Control which apps are visible and can run

Assigned Access

Enable a single (Desktop) or multiple (Mobile) UWP experience

Windows IoT Enterprise Only

Shell Launcher

Enable a single Win32 app experience

Block hotkeys/Filter Keys

Block hotkeys and other keys to prevent system access

Servicing and Edition Summary

Service branch	Options	Windows 10 IoT edition
Current branch (CB)	• Security updates, features, and fixes are automatically applied. • There is no option to delay or customize these updates.	Windows 10 IoT Core
Current branch for Business (CBB)	• CBB includes the requirements of the Current branch but also provides the option of customizing when and which security updates, features, and fixes are applied, similar to how Windows Update works today in current versions of Windows. • Updates cannot be deferred indefinitely. • Windows updates can be managed using enterprise management tools such as Windows Server Update Services (WSUS).	Windows 10 IoT Mobile Enterprise
Long Term Servicing branch (LTSB)	• Flexible options for managing Windows updates. • Windows updates include security fixes and required reliability/performance fixes only. • Windows updates can be managed using enterprise management tools such as WSUS.	Windows 10 IoT Enterprise (all SKUs)

Microsoft Azure IoT Services

Devices	Device Connectivity	Storage	Analytics	Presentation & Action
	Event Hubs	SQL Database	Machine Learning	App Service
	Service Bus	Table/Blob Storage	Stream Analytics	Power BI
	External Data Sources	DocumentDB	HDInsight	Notification Hubs
		External Data Sources	Data Factory	Mobile Services
				BizTalk Services

Windows IoT Enterprise
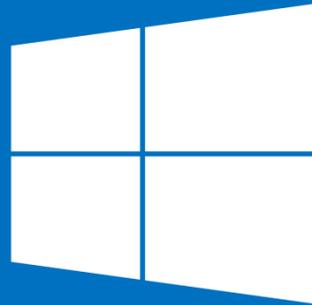
Core Features

Familiar, and better than ever	Windows 10 Pro	Windows 10 Enterprise	Windows 10 IoT Enterprise
Customizable Start Menu	√	√	√
Windows Defender & Windows firewall	√	√	√
Fast start up with Hiberboot and InstantGo[1]	√	√	√
TPM support[2]	√	√	√
Battery Saver	√	√	√
Windows Update	√	√	√
Cortana[5]			
Talk or type naturally	√	√	
Personal and proactive suggestions	√	√	
Reminders	√	√	
Search web, device, and cloud	√	√	
"Hey Cortana" hands-free activation	√	√	
Windows Hello			
Native fingerprint recognition	√	√	√
Native facial and iris recognition	√	√	√
Enterprise level security	√	√	√
Multi-doing			
Virtual desktops	√	√	√
Snap assist (up to 4 apps on one screen)	√	√	√
Snap apps across screens on different monitors	√	√	√
Continuum[4]			
Switch from PC to tablet mode	√	√	√
Microsoft Edge			
Reading view	√	√	
Built-in ink support	√	√	
Cortana integration[5]	√	√	
Universal Windows Platform			
Universal Windows apps	√	√	√
Classic Desktop applications	√	√	√
Microsoft Universal Windows apps included	√	√	
Microsoft Store Client	√	√	

Business Features

Existing fundamentals	Windows 10 Pro	Windows 10 Enterprise	Windows 10 IoT Enterprise
Device Encryption[6]	√	√	√
Domain Join	√	√	√
Group Policy Management	√	√	√
BitLocker2	√	√	√
Enterprise Mode Internet Explorer (EMIE)	√	√	√
Assigned Access 8.1	√	√	√
Remote Desktop	√	√	√
Direct Access		√	√
AppLocker		√	√
BranchCache		√	√
Start Screen Control with Group Policy		√	√
Management and deployment			
Side-loading of line of business apps	√	√	√
Mobile device management	√	√	√
Ability to join Azure Active Directory, with single sign-on to cloud-hosted apps[7]	√	√	√
Business Store for Windows 10[8]		√	
Granular UX Control		√	√
Easy Upgrade from Pro to Enterprise Edition	√	√	√
Easy Upgrade from Home to Education Edition			
Security			
Microsoft Passport	√	√	√
Enterprise Data Protection[8]	√	√	√
Credential Guard[9]		√	√
Device Guard[9]		√	√
Delivering Windows as a service			
Windows Update	√	√	√
Windows Update for Business	√	√	
Current Branch for Business	√	√	
Long Term Servicing Branch		√	√

Name for grouping of features for creating a targeted device experience

Granular UX Control

Granular UX Control	Windows 10 Pro	Windows 10 Enterprise	Windows 10 IoT Enterprise
Unified Write Filter		√	√
Embedded Logon		√	√
Assigned Access		√	√
Shell Launcher		√	√
Embedded Boot Expereince		√	√
Unbranded Screens		√	√
AppLocker		√	√
MDM & Group Policies		√	√

Easily Build Retail Line of Business Solutions
Retail Peripherals Supported Inbox

8.1+	**8.1+**	**NEW**	**NEW**	**3rd Party Enabled**
Barcode Scanner	**Mag-Stripe Reader**	**Receipt Printer**	**Cash Drawer**	**Payment Terminal**
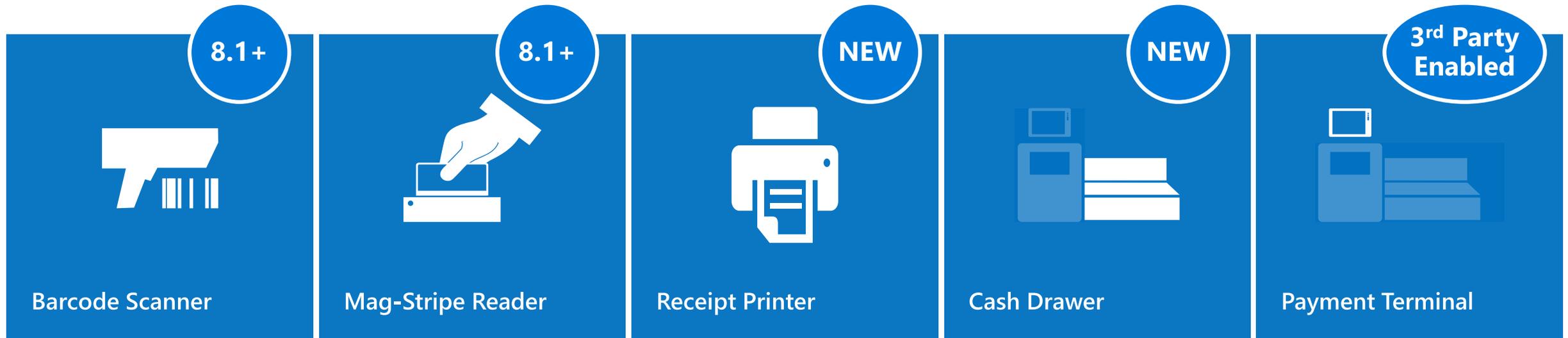
- APIs in Windows 10 SDK and DDK
- Adapted from UnifiedPOS standard

- 3rd provided libraries

Windows IoT Mobile Enterprise
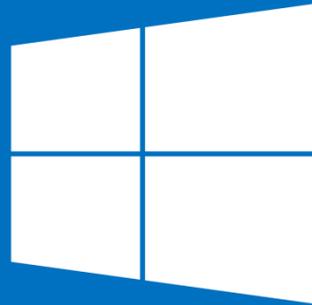
Win10 IoT Mobile Enterprise

Windows 10 IoT Mobile Enterprise includes 100% of the capabilities of Windows 10 Mobile while including features designed to address the most pressing Enterprise issues.

Granular UX Control
o   Launch a Universal Windows app on login plus lock access to system
o   Multi-user profiles with apps and settings allow list

Embedded Boot Experience / Unbranded Screens
o   Customer brand a device by removing and /or replacing Windows UI boot elements

Security
o   Only allow trusted peripherals
o   Secure IoT devices with TPM

Management
-   MDM Enablement
-   Ability to control and block modern app updates
-   Bulk provisioning through barcode/.NFC/SD Card

Servicing:
-   Current Branch for Business

Activation:
o   No activation required

App Platform:
o   Universal Windows Platform(UWP) apps

Tools:
o   Converged toolset: Windows Image Configuration Designer(ICD)

Peripheral / Device Connectivity Support
o   Retail industry peripherals supported in box by Enterprise (Barcode Scanner, Mag Stripe Reader, Receipt Printer, Cash Drawer, Payment Terminals)
o   Access to standard busses (GPIO, I2C, SPI, etc) and system settings via UWP APIs
o   Access to Windows Universal Driver(UD) Platform creates common & Consistent device driver APIs
o   AllJoyn is integrated into Windows 10 core framework.

High-level Enterprise Feature Availability

- **Parity of Features with WEH 8.1:** Close to parity with WEH 8.1
- **Next Generation Credentials** – Support for a number of new authentication methodologies
- **Wi-Fi Only:** Ability to build Wi-Fi only devices
- **USB Host/OTG:** Ability to drive peripherals, Continuum over USB with USB On the Go support
- **Lockdown, Assigned Access:** Ability to lock down an industry device to a specific set of apps and settings based on the signed-in role
- **App-to-App Communication:** Apps can communicate to each other and to second-party services via inter-app messaging enabling greater levels of data sharing.
- **Controlled Update** – Ability to locally host, test and deploy device updates

- **Programmatic Access to HW:** Ability to programmatically control certain device radios (Bluetooth, cellular etc.), control LED notifications, brightness settings
- **OOBE Provisioning via barcode**
- **Step Up:** Ability to inject the 'Win10 Mobile Enterprise' license onto devices thereby enabling controlled updates, unlimited enterprise app side-loading
- Persist provisioning package for **enterprise reset**
- Allows for **deployment of custom scanner profiles** for devices that are shipped by OEMs with scanners
- **Suppression of Privacy, Consent and Device Pairing UI**
- **Better access to device HW**
- **Embedded Mode**

Barcode Based Device Provisioning

OEM or Enterprise IT can use barcode scanning to provision mobile devices during OOBE

Support scanning a provisioning package that has been split over multiple barcodes

Not OEM-specific and hardware independent

Suppression of Privacy, Consent and Device Pairing UI

IT Pros can suppress privacy consent prompts and device pairing confirmation dialogs on Windows Mobile

Ability to provision and manage enterprise devices silently

Industry Connectivity Support

WiFi only Mobile devices

USB Cellular Modem/MBB – data only

802.11r support to enable Fast Roaming

Ethernet over USB

USB Host and OTG to enable peripheral connectivity

Customize Device Experience Based on Roles
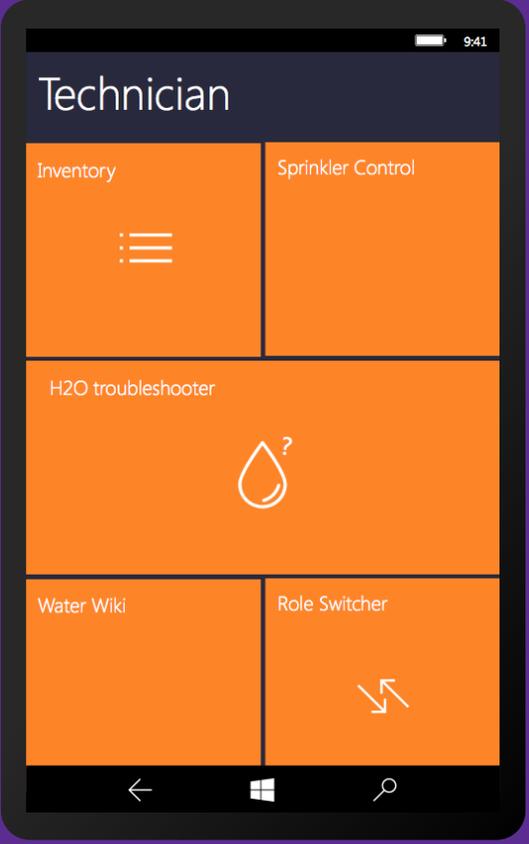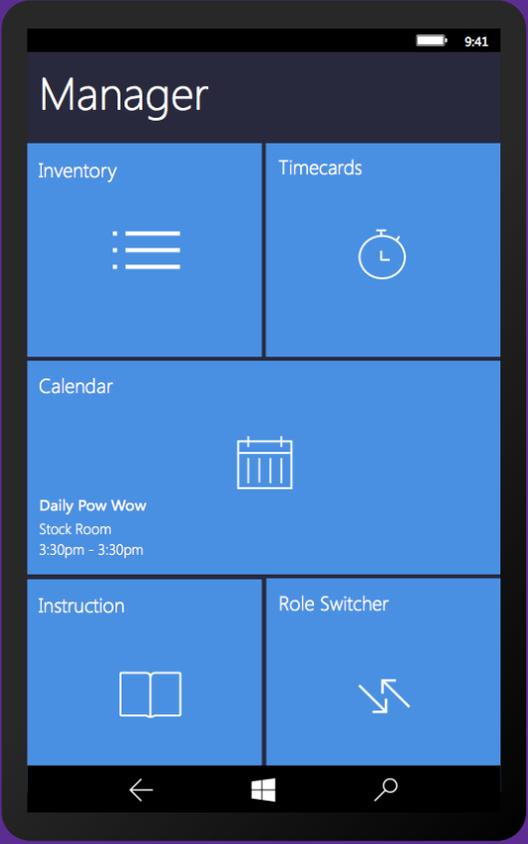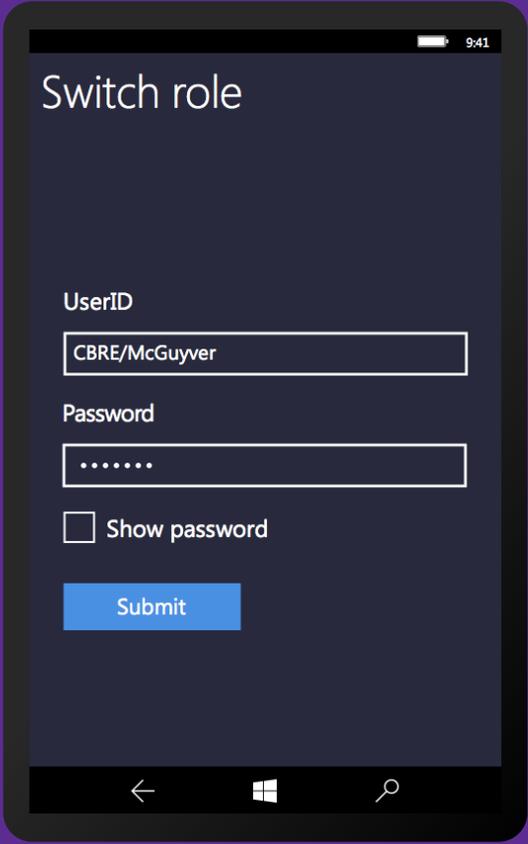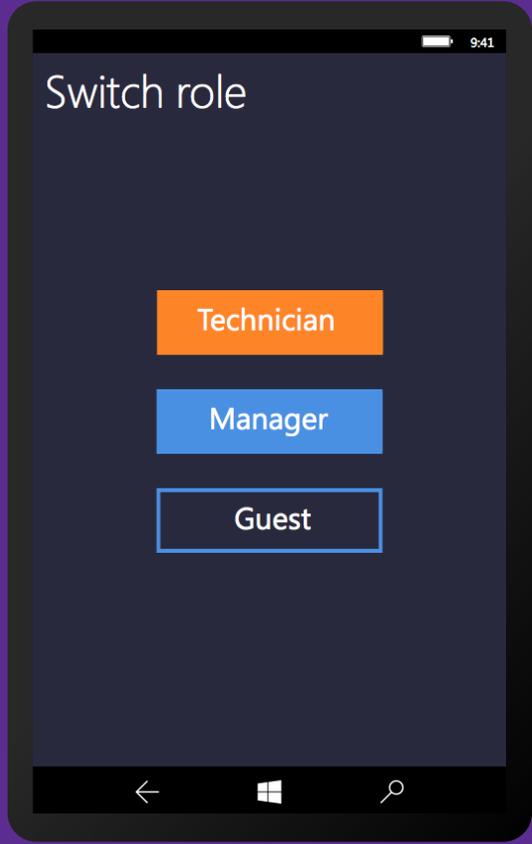
Windows IoT Core
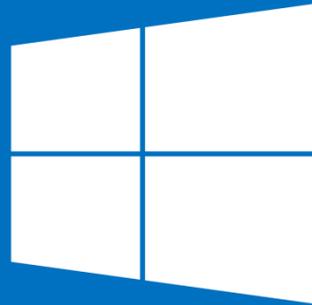
Windows 10 IoT Core: Benefits

Scalable Platform
- UWP extended to small devices
- UD driver model
- Lower cost silicon
- Low barrier to entry

Servicing
- Bring latest technology updates to small class of devices

Device Connectivity
- Wireless connectivity (BLE, Wi-Fi, MBB)
- Wired connectivity (Ethernet, USB)
- Access to busses (GPIO, I2C, SPI)
- AllJoyn

Manageability
- Manage IoT devices like any other Windows device

Security
- Windows grade security for small devices
- Support for Trusted Platform Module

Cloud Integration
- Built in cloud connectivity
- Azure IoT services

Min System Requirements
## Windows 10 IoT Core OS only

Component	With UI	Without UI
Processor	x86 and ARM, 600MHz or faster	x86 and ARM, 400MHz or faster
RAM	512MB (Design dependent)	256MB (Design dependent)
Storage	Flash = 2GB	Flash = 2GB
Display	Frame buffer graphics and 2D optional (720p HDMI / 1080p+ HDMI / 3D GPU optional for modern UI support)	N/A
Audio	Optional	Optional
Connectors	Optional	Optional
Wireless	Optional	Optional
Accelerometer & Proximity Sensor	Optional	Optional
Touch		Optional
UI	Optional	

Dev Boards for Windows 10 IoT Core

Rapidly prototype Windows 10 IoT Core solution

Developer Boards	CPU*	Board details*
Raspberry Pi 2	900MHz quad core ARM Cortex-A7	4 x USB 2.0, 40 pin GPIO I2C & SPI bus, Full HDMI Ethernet, Audio jack Micro SD card slot Memory: 1 GB
MinnowBoard MAX	64-bit Intel Atom E38xx Series SoC E3815 or E3825 Dual Core 1.33 GHz	1 x USB 2.0, 1 x USB 3.0 Memory: Up to 2GB 8 GPIO, I2C & SPI bus Mini HDMI, Ethernet 1 x SATA2 3Gb/sec Audio jack, Micro DD card slot
DragonBoard 410c	Quad-core ARM Cortex A53 1.2 GHz 64-bit capable	2 x USB 2.0, 1 x Micro USB 2.0 Micro SD card slot Full HDMI One 40-pin low-speed expansion connector, One 60-pin high-speed expansion connector, Memory: 1 GB

* Reference online for latest specs and more details on dev boards

What this means to you

Microsoft Windows 10 IoT brings one converged Windows operating system that powers your Internet of Things (IoT) devices by providing a single platform for management, security and application development for enterprises that look to gain sustainable competitive advantage through the power of the latest connected device technologies.

Microsoft