Microsoft

Universal Windows Platform (UWP) and Universal Driver

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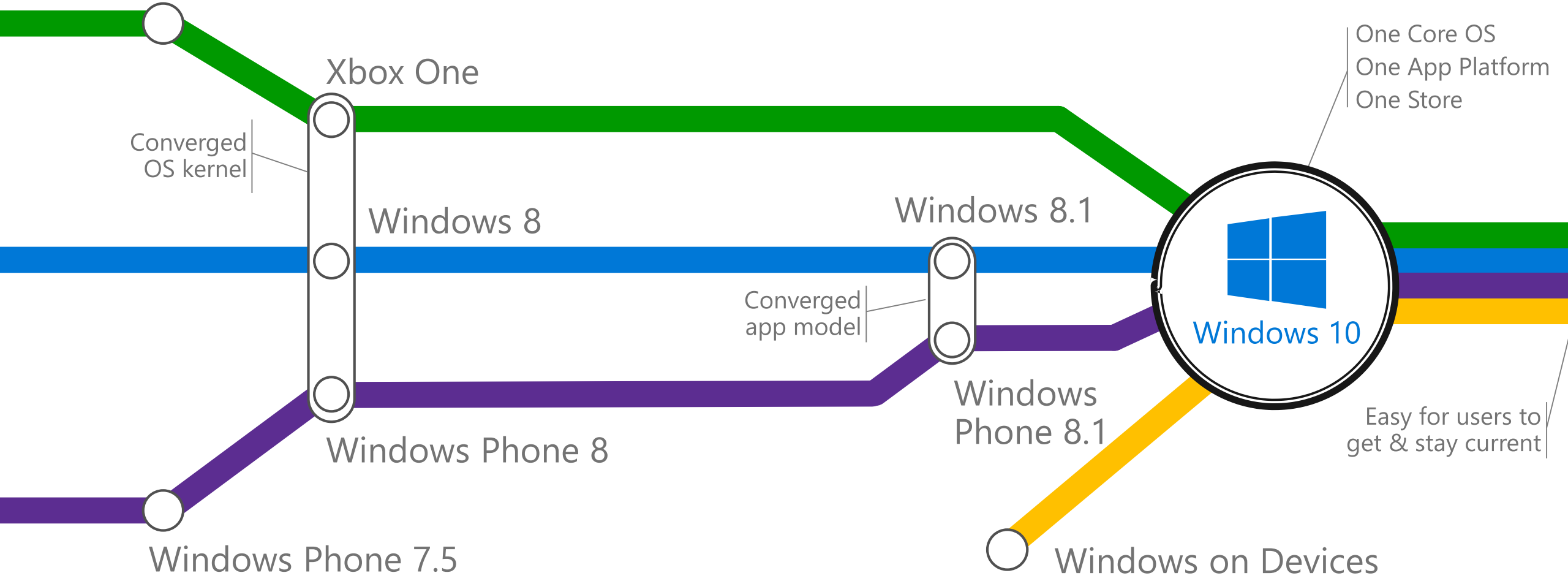
Agenda

- Journey to One Windows
- Universal Windows Platform
  - Software Architecture
  - Adaptive UI
  - Adaptive Code
- Universal Driver
  - Universal API Set
- Demo

The Journey to one Windows…



On a Full Range of Devices

Phone

Phablet

Small Tablet

Large Tablet

2-in-1s
(Tablet or Laptop)

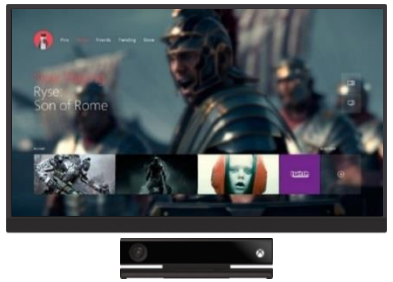
Classic
Laptop

Desktops
& All-in-Ones

Windows 10

Surface Hub

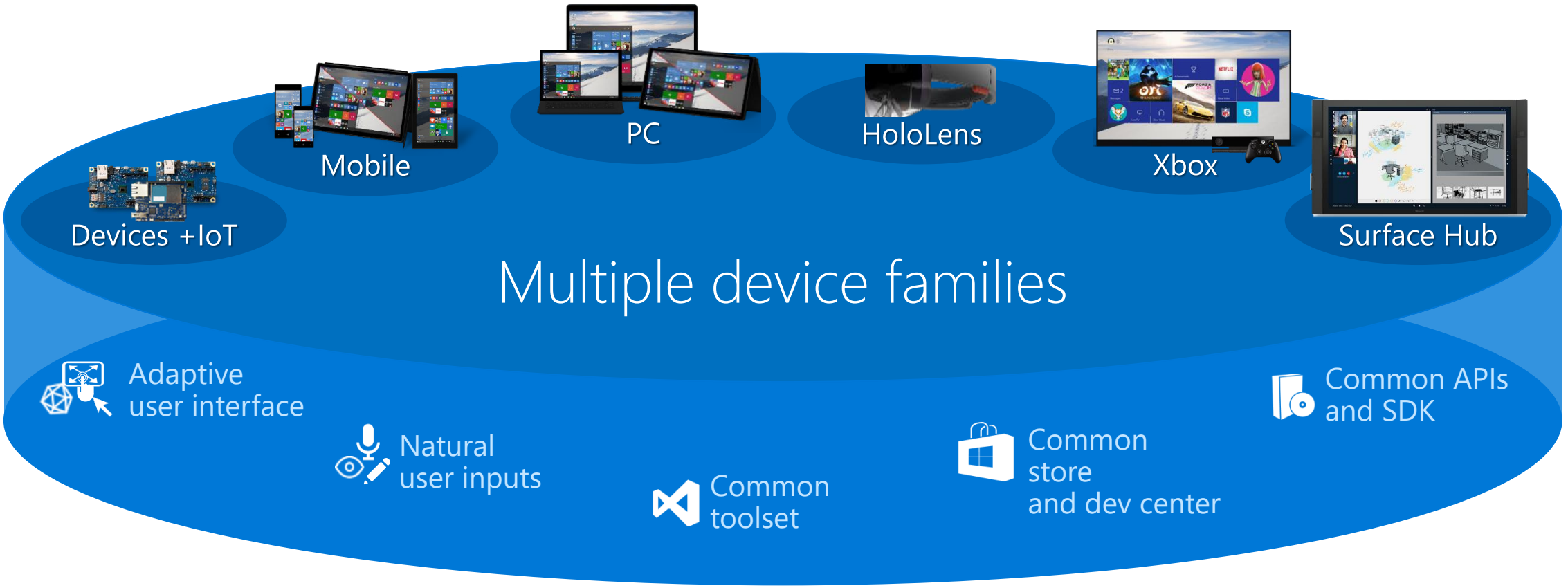
Xbox



Holographic

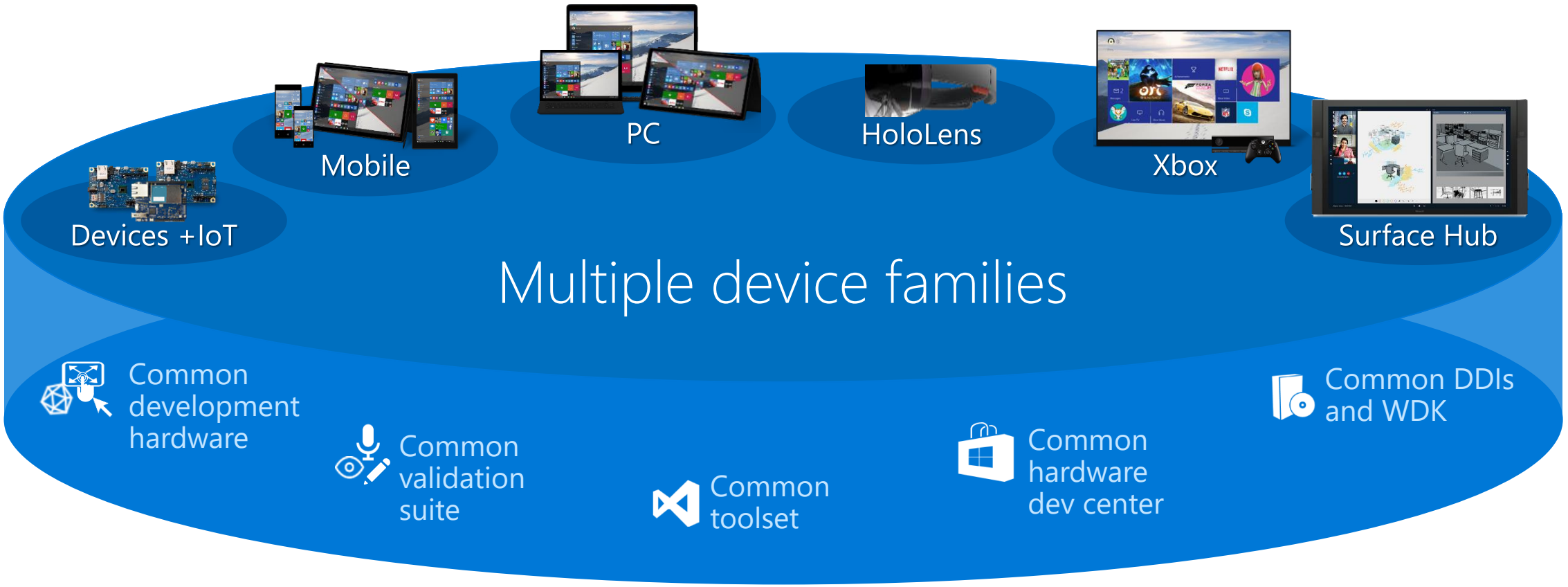
IoT

…with one app platform



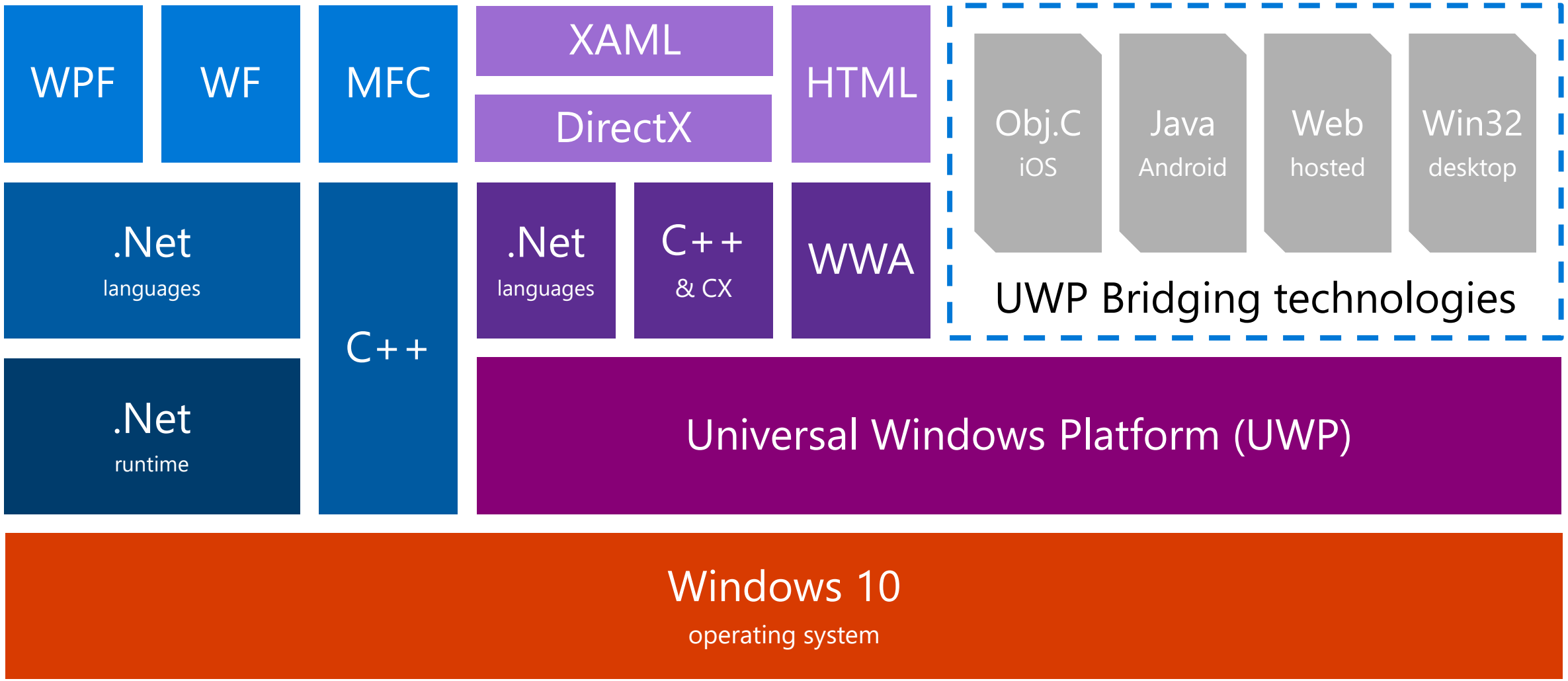
One App Platform

…and one device platform



Universal Windows Platfrorm App

Windows 10 Software Architecture

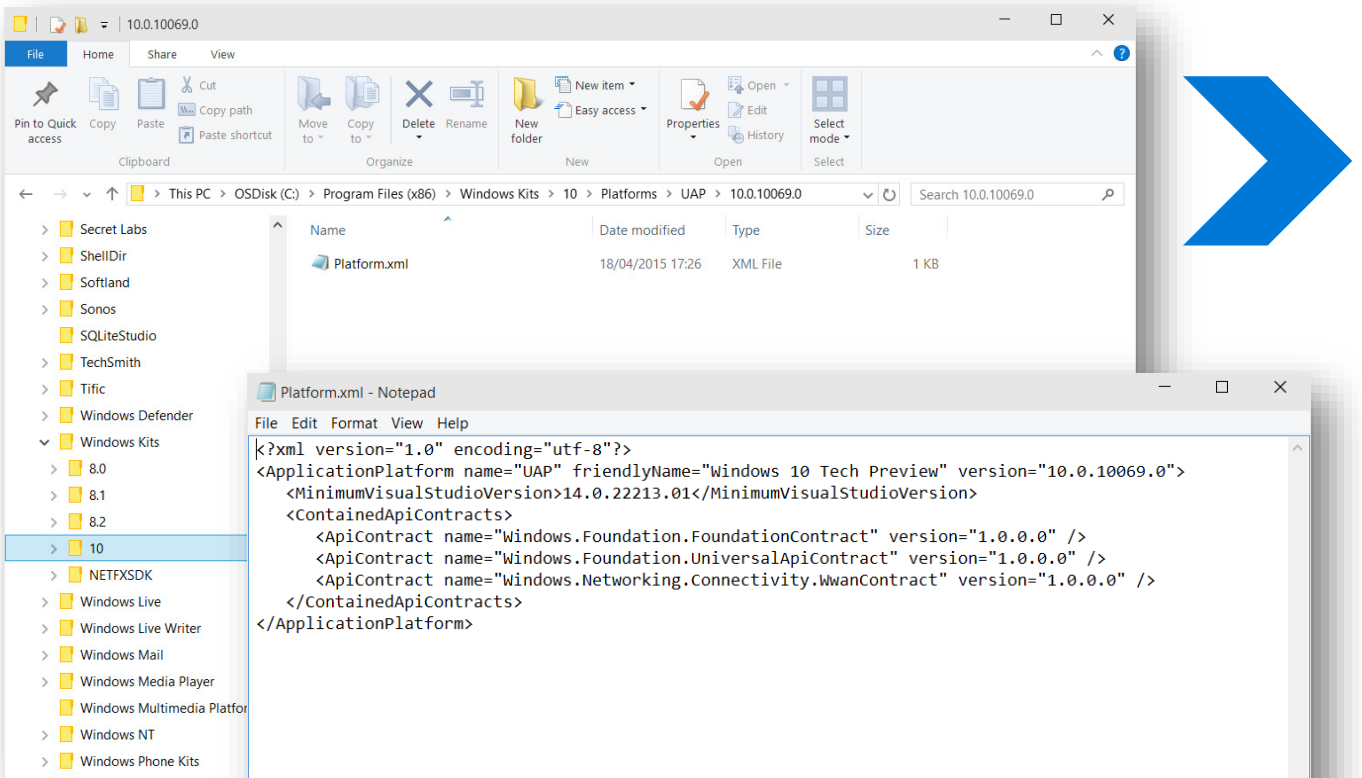


Universal Windows Platform(UWP)

A single API surface

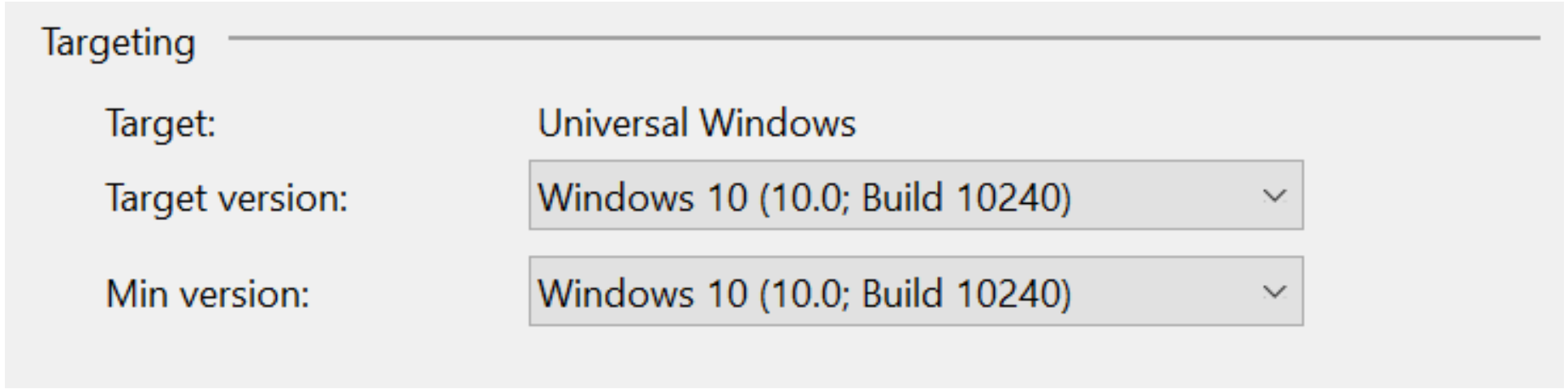
A guaranteed API surface

The same on all devices

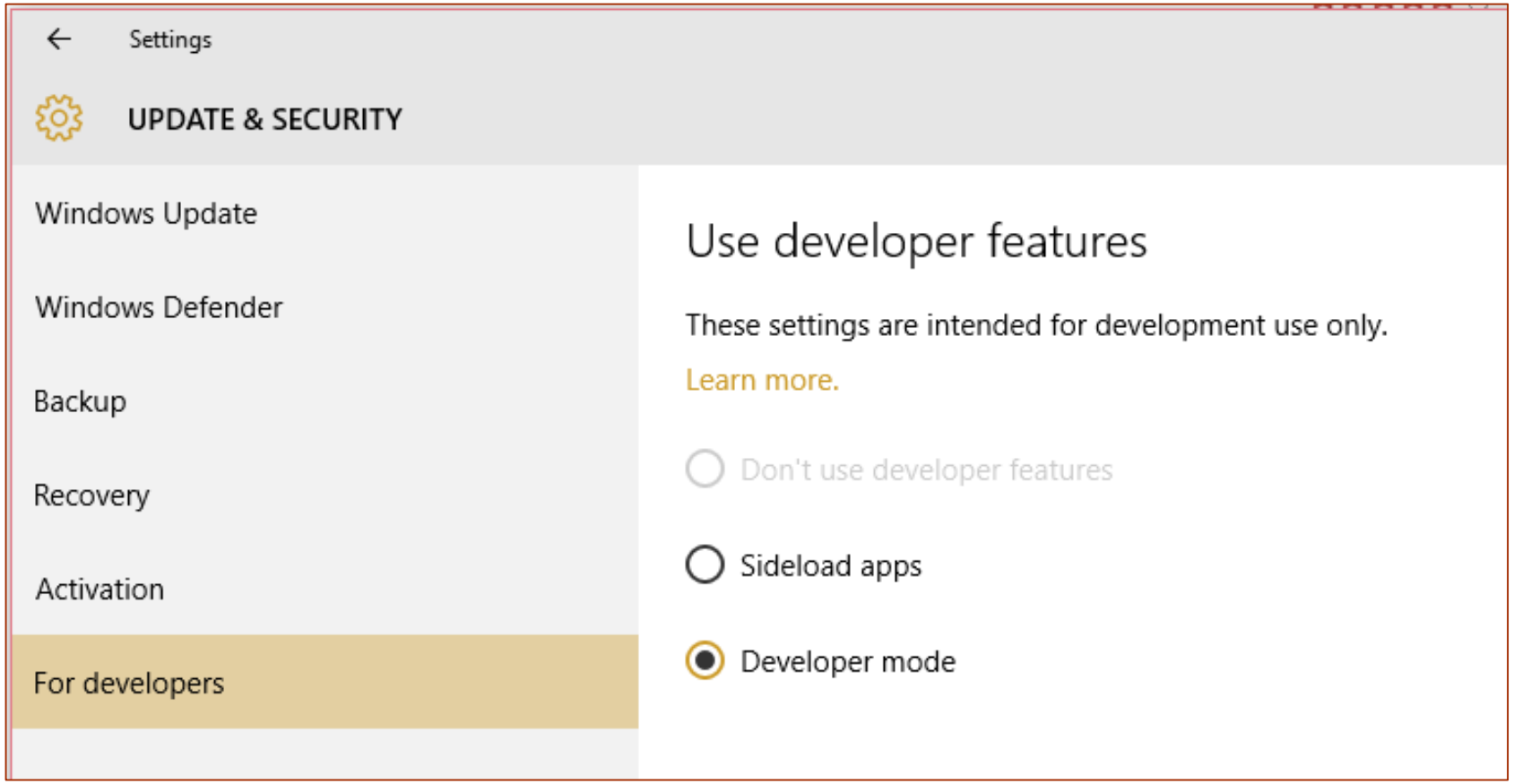


Project Target Version

When you create an app, you target a version of UWP, not of the operating system.



Unlock Developer Mode

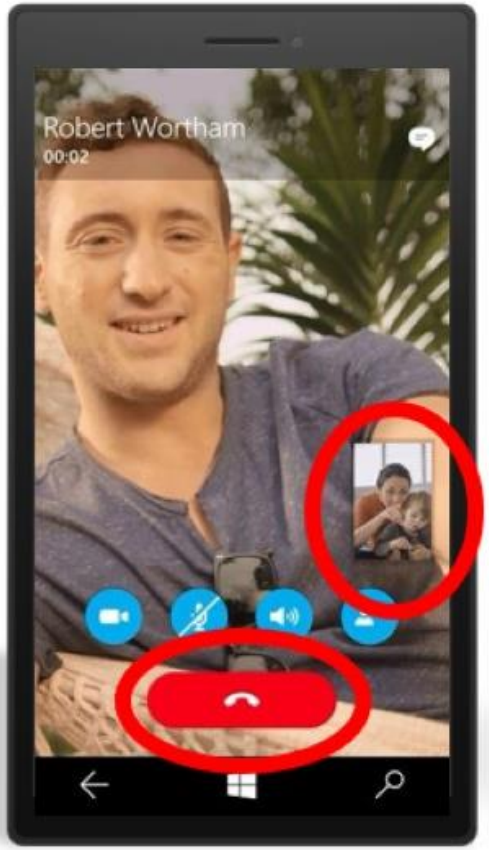


Adaptive UI

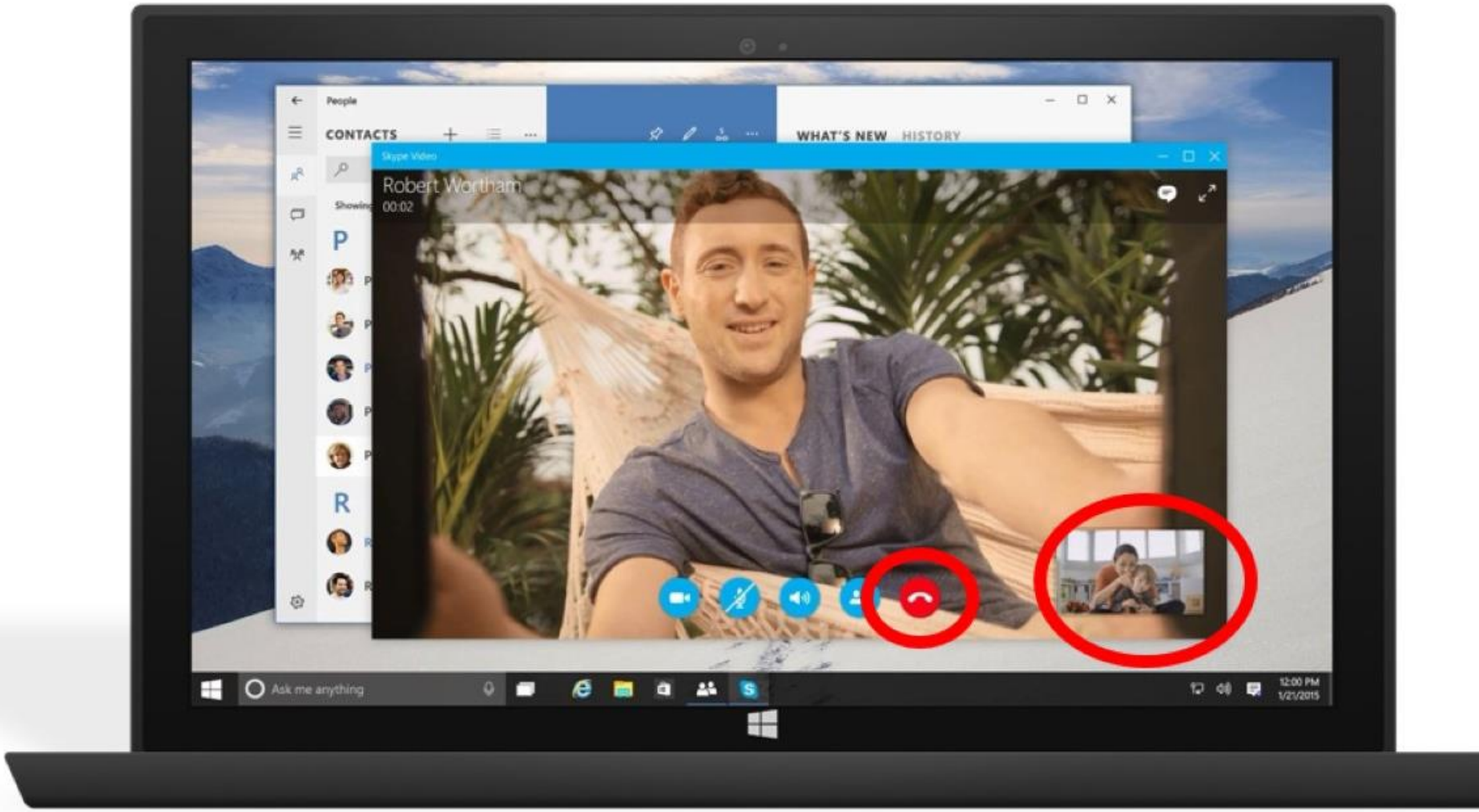
Adaptive Design

Same Code, Same Controls, Optimized Layout

Phone (portrait)



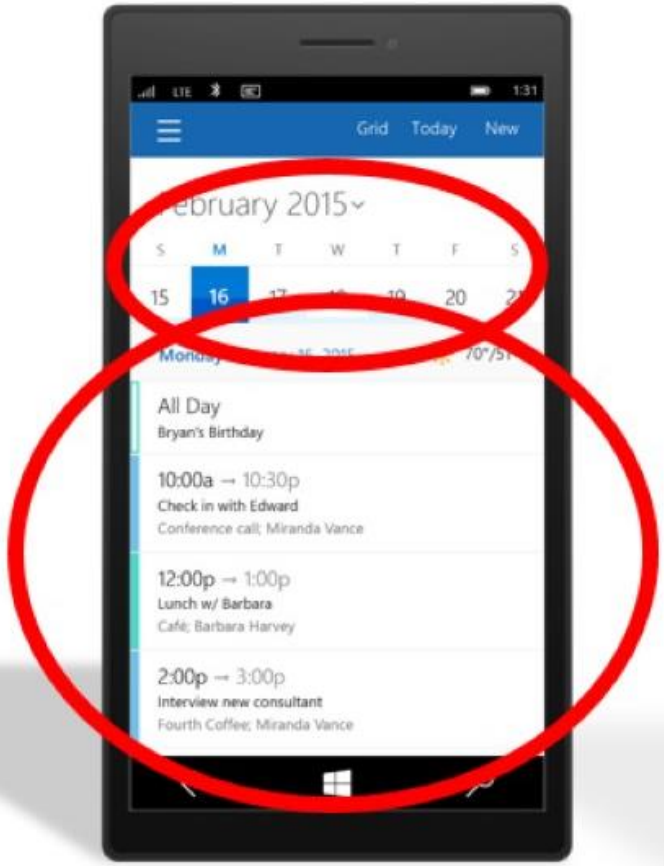
Tablet (landscape) / Desktop



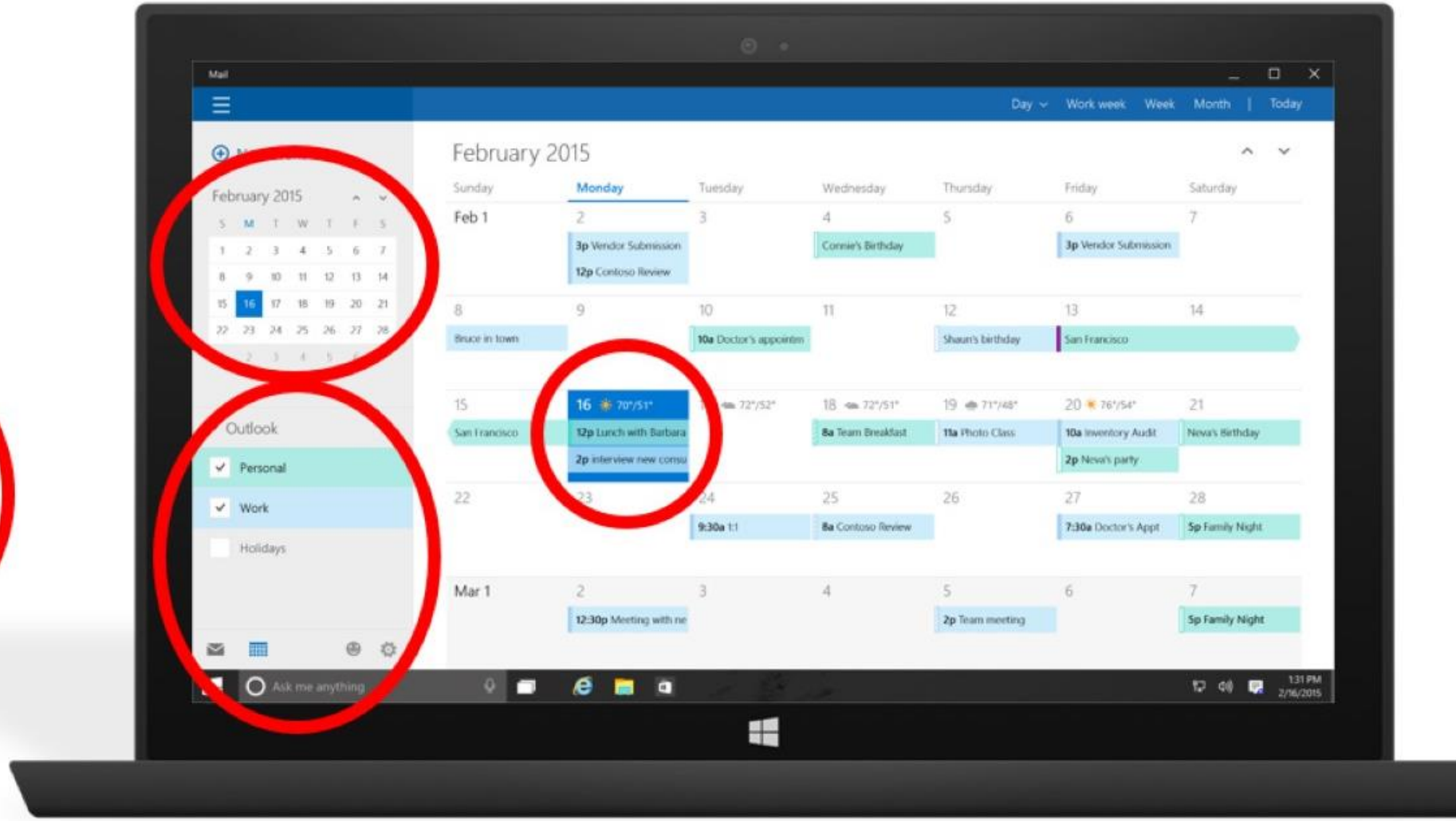
Tailored Experiences

Based on a set of adaptive controls and enable an experience to the device.

Phone (portrait)



Tablet (landscape) / Desktop

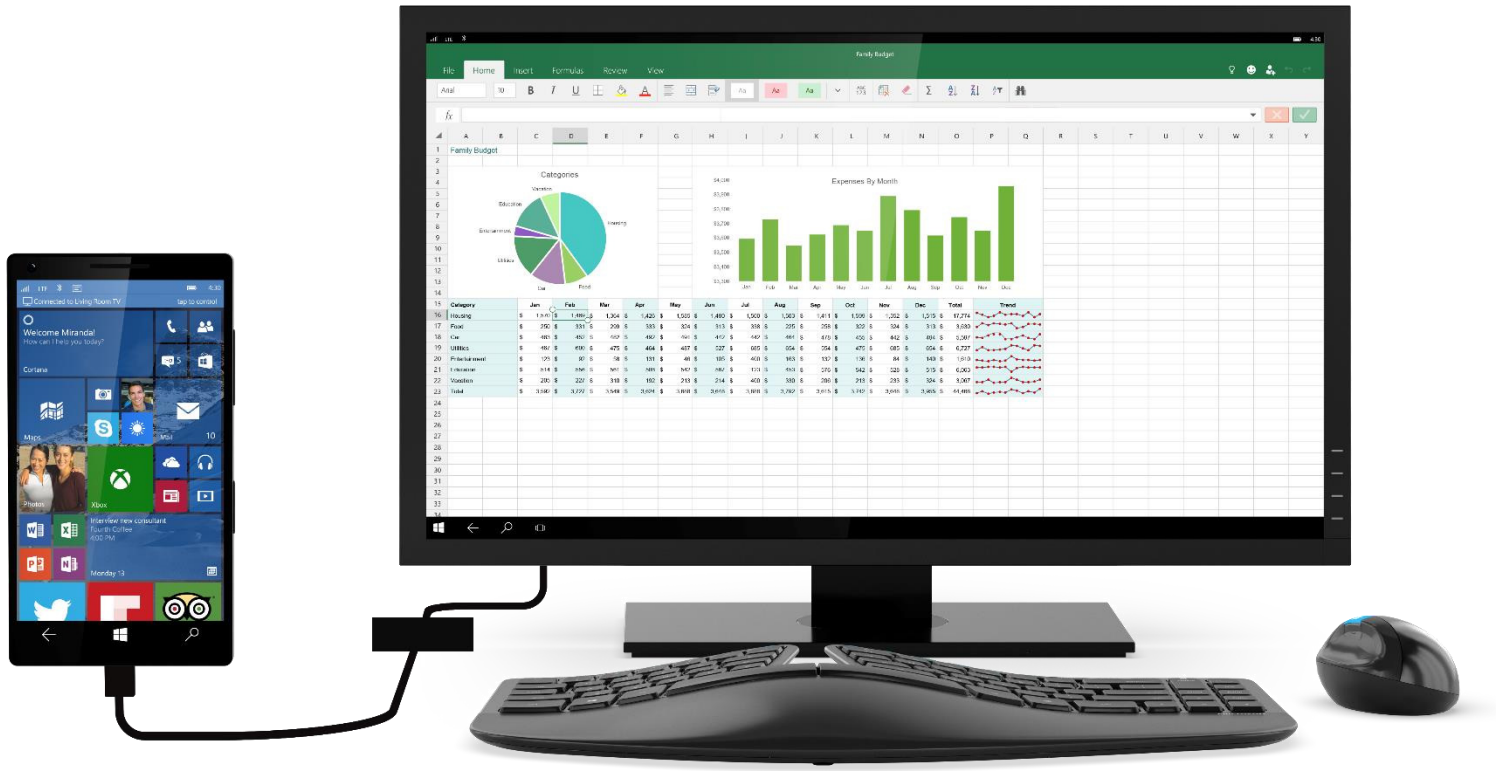


Continuum

Your Phone is your PC !

Brings UWP app to any screen, powered by a phone.

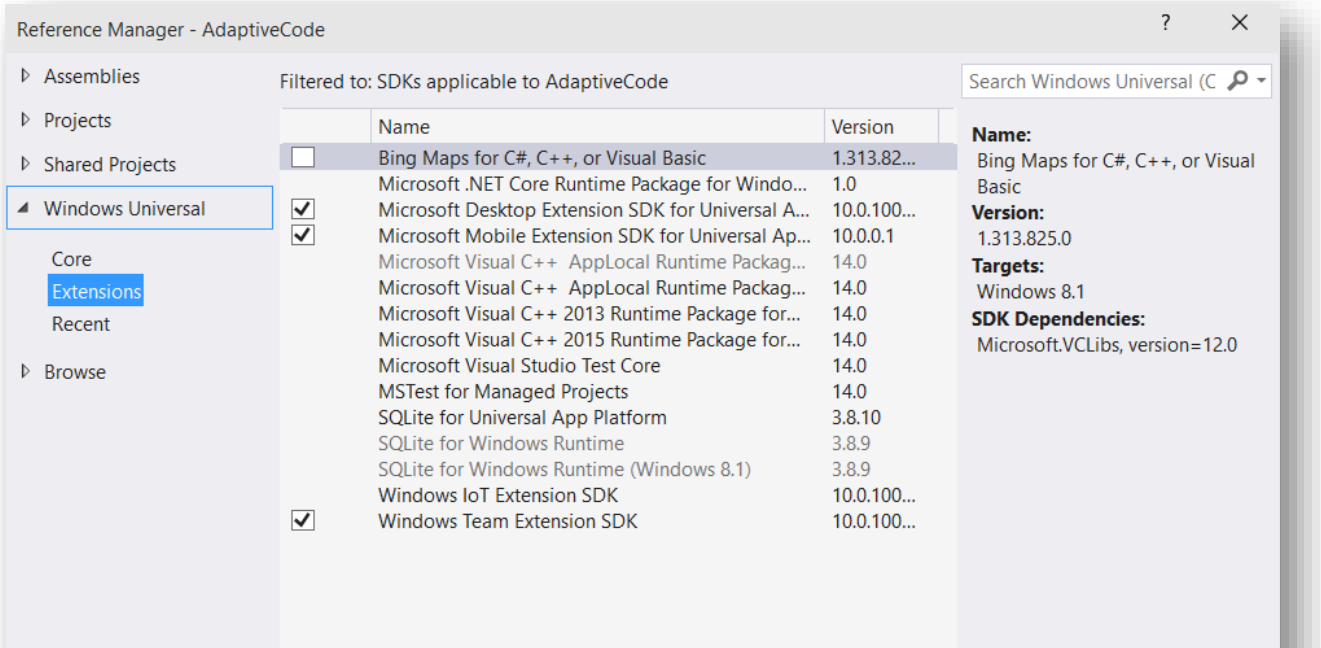
- Two apps run simultaneously on two screens.
- Keyboard and Mouse Support

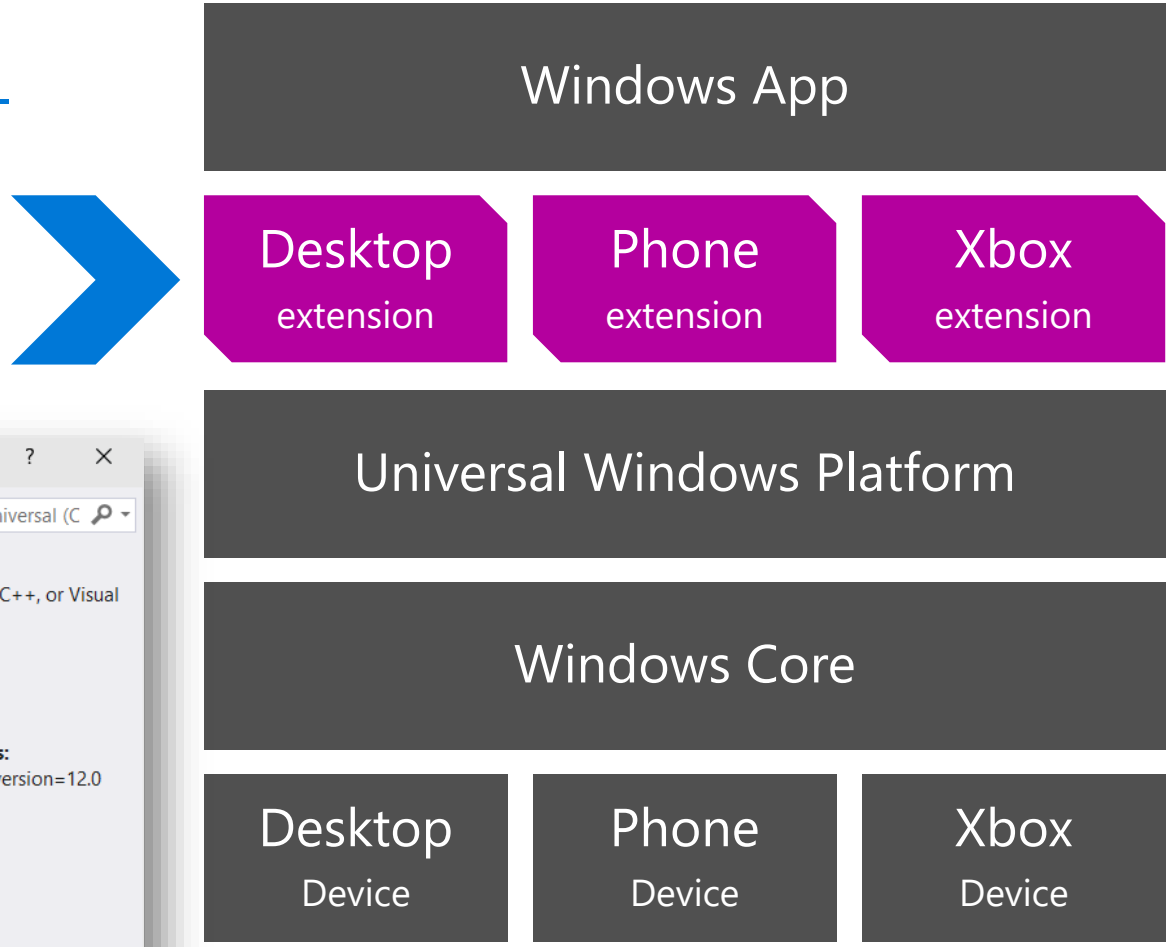


Adaptive Code

Platform Extensions

Enhance your app on specific device using device-specific API.





Test Capabilities at Runtime

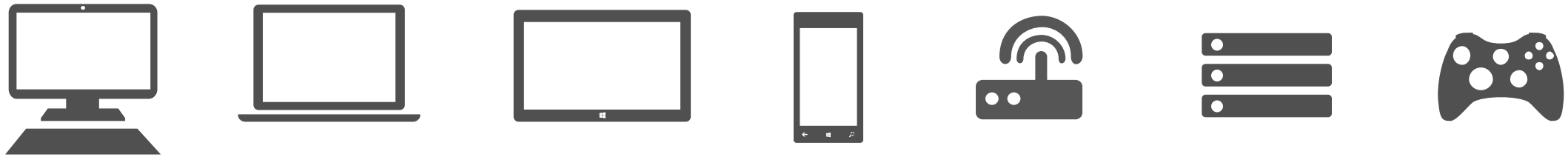
Use Windows.Foundation.Metadata.ApiInformation APIs to write adaptive code across different versions and devices.

```
var api = "Windows.Phone.UI.Input.HardwareButtons";
if (Windows.Foundation.Metadata.ApiInformation.IsTypePresent(api))
{
   Windows.Phone.UI.Input.HardwareButtons.CameraPressed
        += CameraButtonPressed;
}
```

Universal Drivers

Windows Universal Driver Platform

- Write **ONE** Universal Driver and target all Windows 10 editions
- **Scale** and get **higher ROI** by selling same components to all Windows 10 editions OEMs/ODMSs

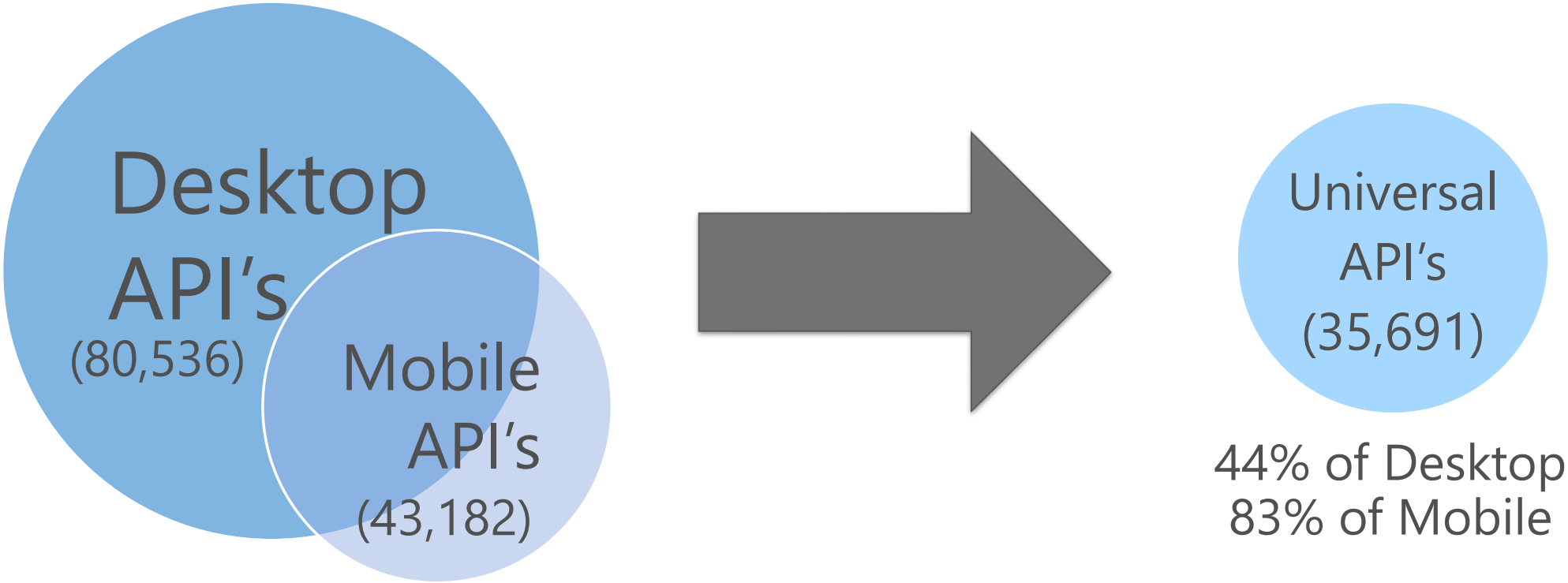


Windows Universal Platform
Common & Consistent Device Driver APIs

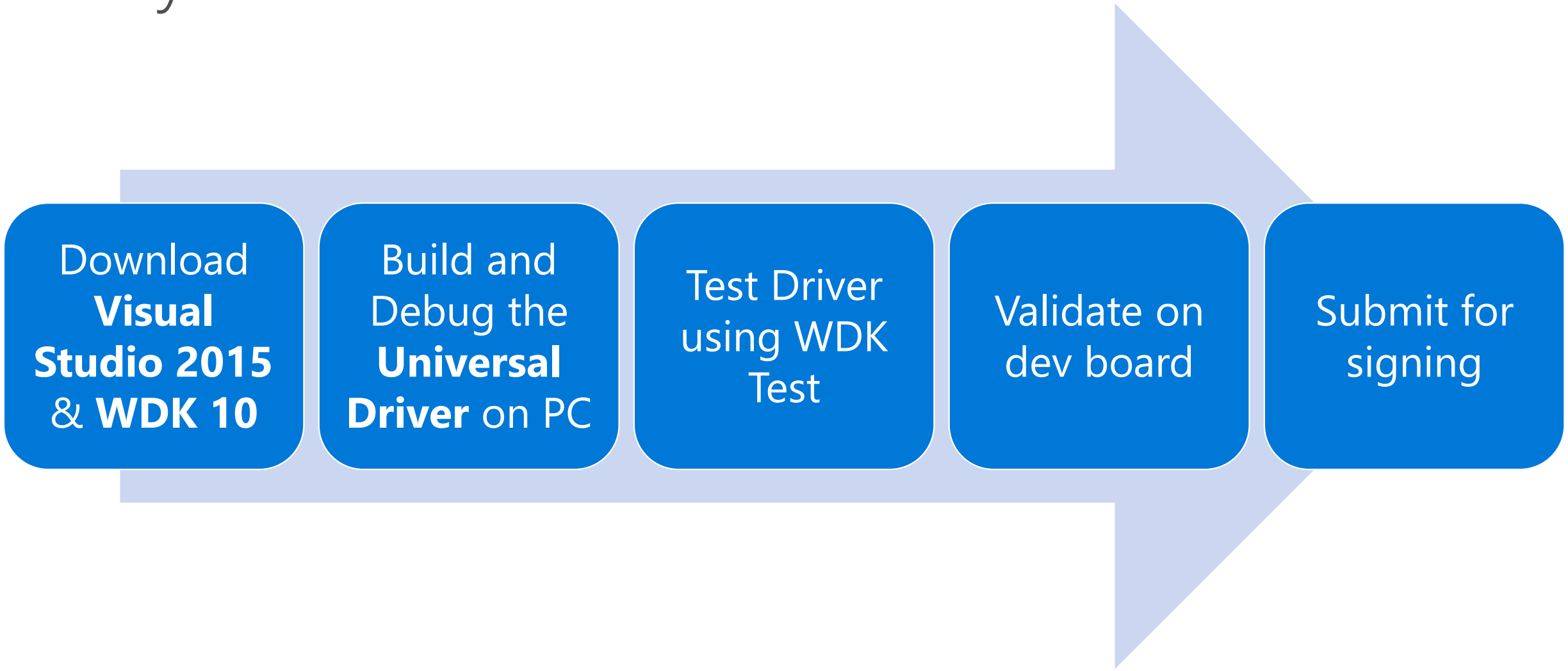
WDF	Location	NFC
Audio	Networking - Wired	Sensors
Bluetooth	Networking - WLAN	Thermal
Buses (USB, SPB)	Security - Biometrics	Touch
HID(Retail), Buttons	Security - Crypto	UEFI
Camera	Security - Smartcard	Video
Graphics & Display	Security - TPM	

Universal Driver API Set

We scanned over **100k drivers** to create a universal driver API set.



Easily Build Universal Drivers



Universal Driver samples & templates available as a starting point

Move to Universal Driver, run on more devices

If you are using	Actions to take	Why
Inbox/Class drivers	• It just works! core device types Storage, mouse, keyboard, touch, video,…	Your device automatically leverages a large ecosystem of peripherals
Kernel Mode drivers	• High backwards-compatibility for converged device areas • Make minimal changes and test	Your driver runs on more editions
User Mode drivers and services	• Know that Windows Universal Platform Win32 API surface is smaller than desktop Windows • Use replacement APIs where available • Re-design/re-implementation if APIs are not available and test	Your driver runs on more editions

Universal Driver Validation Tools

APIValidator.exe tool

- Included in the WDK

  "C:\Program Files (x86)\Windows Kits\10\bin\x86\apivalidator.exe"
- Run as a post build process in VS2015 for Universal Drivers

  Also can be run on command line:

  ```
  Apivalidator.exe -DriverPackagePath:<driver folder path>
  -SupportedApiXmlFiles:<path to XML files containing supported
  APIs for universal drivers>
  ```
- Flag APIs used in the driver project that are not part of UWP

InfVerif.exe tool

- Included in the WDK

  "C:\Program Files (x86)\Windows Kits\10\Tools\x86\infverif.exe"

- Run as part of build process in VS2015 with WDK10

  Also can be run on command line:

  ```
  infverif.exe -u <A space-separated list of INF files to analyze>
  ```

- Test a driver INF file by reporting INF syntax problems. The tool also reports if the INF file is universal.

Windows Dev Center
https://dev.windows.com/

Demo

UWP App and Universal Driver

Useful Links

- Introduction to Universal Windows Platform (Traditional Chinese)

  https://channel9.msdn.com/Series/uwp-jumpstart/01
- Building Devices with Windows 10 IoT

  https://channel9.msdn.com/events/WinHEC/2015/IOT201
- Creating Universal Drivers with WDK 10

  https://channel9.msdn.com/Blogs/WinHEC/Creating-Universal-Drivers-with-WDK-10

Microsoft