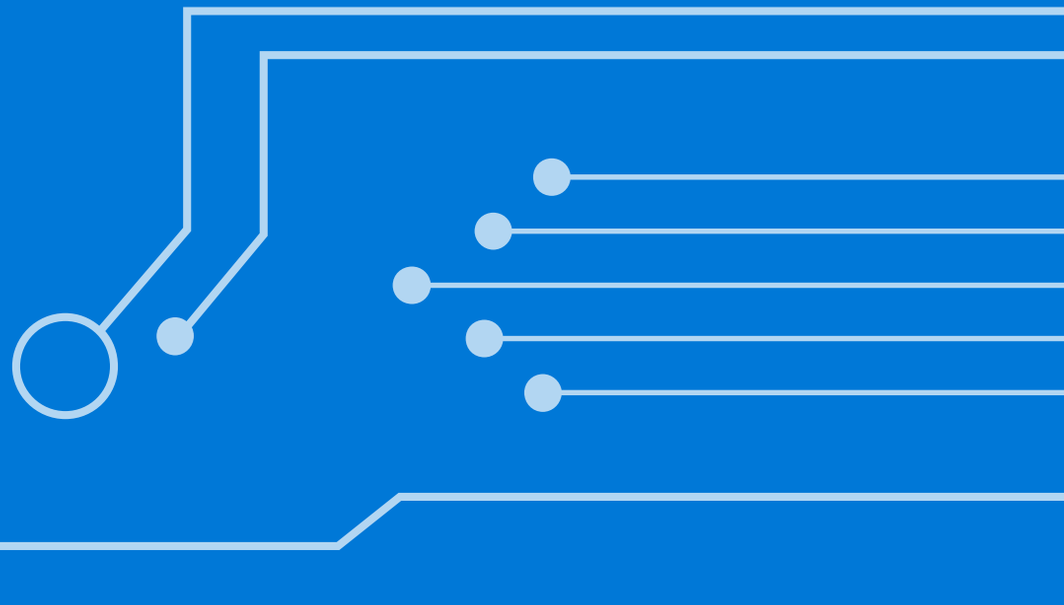
Windows

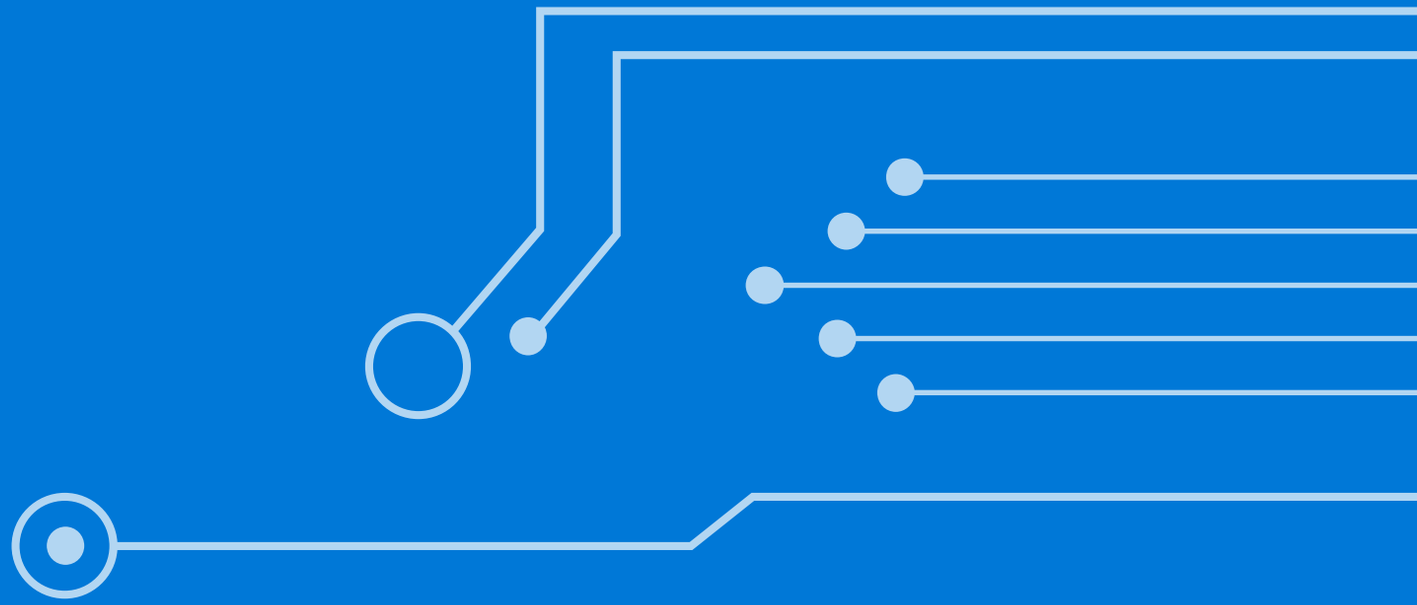
WinHEC

Shenzhen 2016



Windows Hello for Everyone

Chris McMillan
Senior Program Manager
Windows Devices Group



Windows

WinHEC
Shenzhen 2016

Agenda

Momentum

What's new in the Creators Update

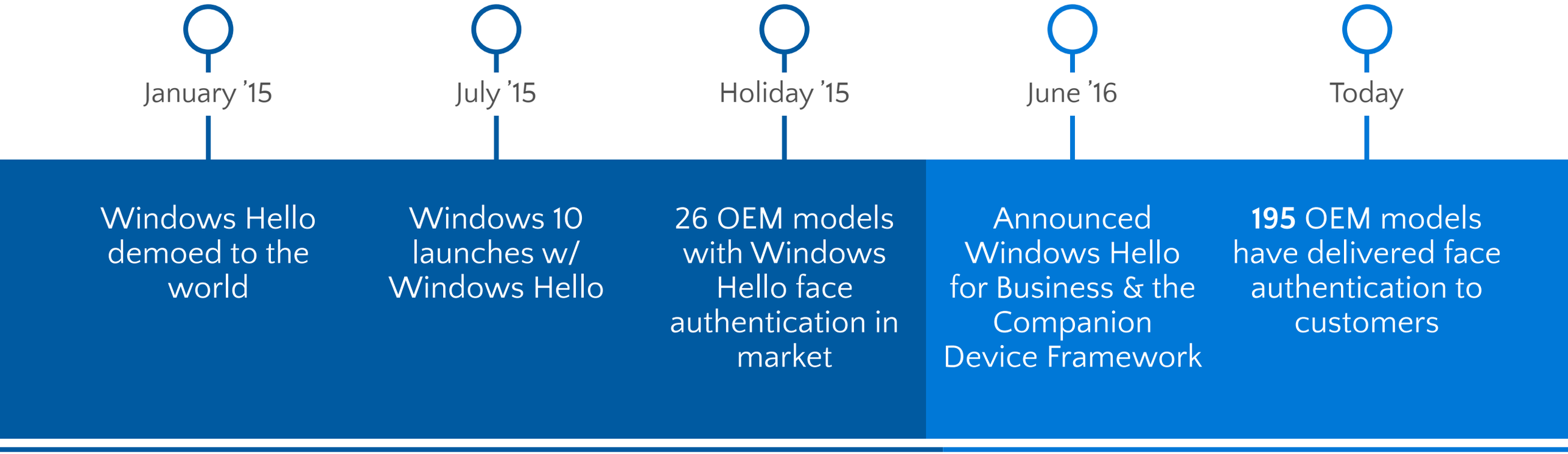
Ease of implementation

Call To Action

Resources


Thank You

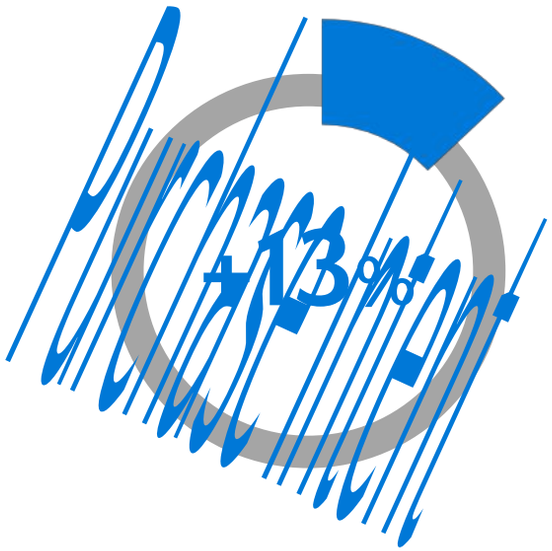
Windows Hello Momentum



Windows Hello Opportunity

CUSTOMERS **WANT IT**

People know Windows Hello[1]



People want to buy when Windows Hello is there[2]

CUSTOMERS **LOVE IT**

Consumers use it daily[3]

When they use it they love it![3]

[1]Source: Microsoft Market Research Nov 2016. Represents awareness for Windows Hello amongst Windows 10 users.
[2]Source: Microsoft Market Research Aug 2016.
[3]Source: Microsoft data & statistics Nov 2016.

Our Partner Ecosystem

Thank You

You are the password

Windows Hello is the password-free sign-in that gives you the fastest, most secure way to unlock your Windows devices.* Using your face, fingerprint or companion device, it recognizes you apart from all others. It waves you in with a friendly hello and even works on apps and Microsoft Edge websites

- Fast and password-free
- Enterprise-grade secure
- Quick sign-in to apps and websites too
- Your companion devices unlock your PC

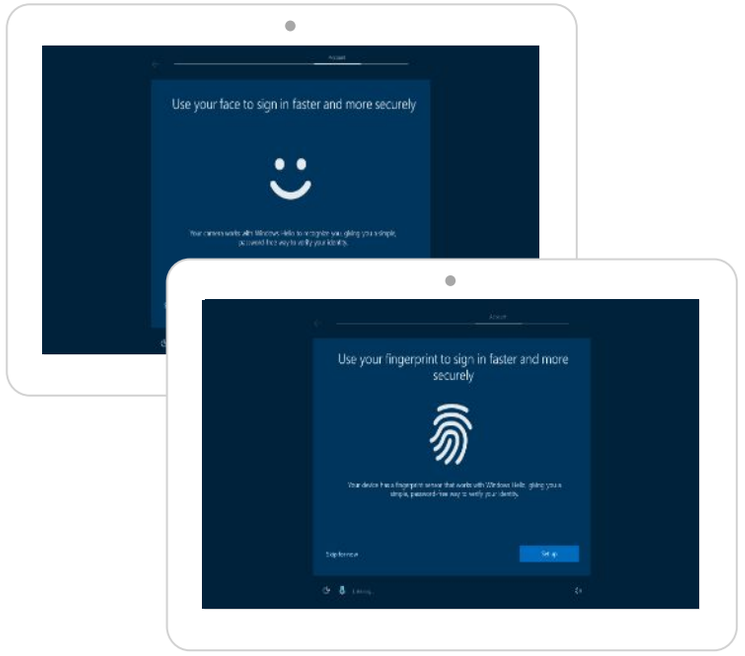
Windows Hello in the Windows 10 Creators Update

Windows Hello Experience

Enrollment

Setup Process

In OOBE but can also be launched via settings.



Login

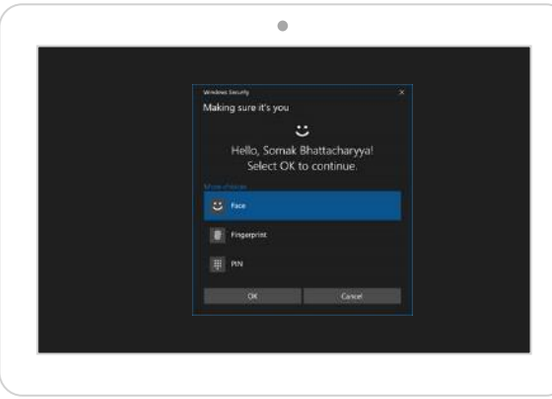
Device Unlock

Upon boot or resume, use your biometric to unlock your device

Re-auth

App or Website

As credentials are needed, apps or websites can request to verify you are using your device.



New: Windows Hello Enrollment Reminder

If a user skips enrollment in out of box experience

Toast notification to prompt user to enroll their biometric sensor

Improving Windows Hello reliability

Face authentication algorithm improvements

Improved performance and accuracy in bright environments

Integration of secure matching

Move IHV / ISV matching engines into Virtualization Based Security (VBS) to isolate matching from OS

We already do this for face authentication today; co-engineering with fingerprint IHVs

Improving the Windows Hello driver pipeline

Link to Windows Hello FrameServer implementation kit

FrameServer for Windows Hello will replace IFrameProvider in Creators Update and beyond

Utilize UVC driver for RGB Camera and IR Sensor Streams:

Write the face (DDI) & device MFT files

MIPI based devices are supported by Intel® or AMD

Improved Camera Pipeline Performance

Simplified driver development with use of FrameServer – less code to maintain

Better concurrency and resource management

FrameServer is required for new devices shipped with the Creators Update

	IR Camera* KSCATEGORY_SENSOR_CAMERA (Mandatory)	RGB Camera* KSCATEGORY_VIDEO_CAMERA (Mandatory)	Hybrid RGB & IR Cameras Register under: KSCATEGORY_VIDEO_CAMERA KSCATEGORY_SENSOR_CAMERA

UVC	• Face Authentication Support through Extension Units and Device MFT (Media Foundation Transform) (Mandatory). Only one Hello-capable Stream.
	• If Multiple Media Types on Hello-capable IR Stream:
	  • Default Media Type must be Hello Capable (Mandatory)
	• Concurrency Support through Sensor Group specified in INF (Mandatory)
	• ROI-based Exposure Control (Optional)
		• Concurrency Support through Sensor Group specified in INF (Mandatory)
		• If Multiple Media Types on Windows Hello-paired RGB-streams:
		  • Default Media Type must be Hello Capable (Mandatory)
		• ROI-based Exposure Control (Optional)
			• Hybrid devices can support separate IR and RGB frames through INF Profiles
			• Device MFT needs to ensure that the Color Pin is defined as shareable.
			• If Multiple Media Types on Windows Hello-paired IR and/or RGB-streams:
			  • Default Media Type on IR and RGB streams must be Hello Capable (Mandatory)
			• ROI-based Exposure Control (Optional)

MIPI	• The partner must author a complete FACE AUTH DDI (Mandatory). Only one IR stream can be Hello Capable.
	• IF Multiple Media Types on IR Stream:
	  • Strongly recommend the use of Face Auth Profile
	• If FACE AUTH PROFILE ***not*** supported:
	  • Default media type on IR Stream should be Hello capable
	• Concurrency Support through INF or KS API Concurrency Profiles (Mandatory)
	• ROI-based Exposure Control (Optional)
		• Concurrency Support through INF or KS API Concurrency Profiles (Mandatory)
		• If Multiple Media Types on Windows Hello-paired RGB-streams:
		  • Default Media Type must be Hello Capable (Mandatory)
		• ROI-based Exposure Control (Optional)
			• Hybrid devices can support separate IR and RGB frames through INF or KS API Profiles
			• If Multiple Media Types on Windows Hello-paired IR and/or RGB-streams:
			  • Default Media Type on IR and RGB streams must be Hello Capable (Mandatory)
			• RGB is defined by preview pin. By default the preview pin is shareable.
			• IR uses Video Capture pin, and source type marked as "IR."
			• ROI-based Exposure Control (Optional)

FrameServer Implementation table detailed in slide appendix

Improving Windows Hello reliability

Windows Hello driver signing active in Q1CY'17

Compatibility will not be broken: iFrameProvider (legacy) devices will continue working seamlessly with Windows

Signing flow is identical for face authentication and fingerprint solutions

Driver signing applicable for new devices shipping with Creators Update and beyond (running FrameServer)

Windows Hello capable devices must meet feature hardware requirements to obtain a signed driver

Devices without a signed driver will not enable Windows Hello capabilities

Run in test mode to test your device prior to signing driver

Enforcement of signing starts in Q2CY'17

Windows Hello Face Authentication – Spec 3.1

Updated Camera Hardware Spec – Launched this week

Reduced Relative Illumination to 35%

Algorithm improvements reduce illumination requirements reduced system power and heat dissipation

Reduced minimum RGB resolution requirement to 480x480 for a 40°x 40° FOV

&

RGB camera FOV should exceed IR camera FOV

Improved accuracy for more reliable authentication experience

“Engineer for success in delivering the right experience to customers”

Improving Windows Hello tools

Test Tools

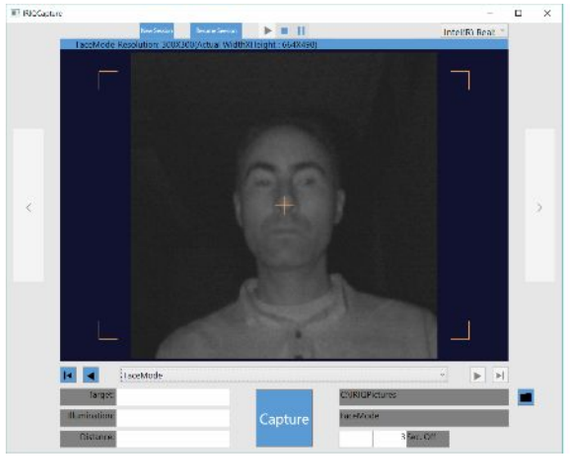
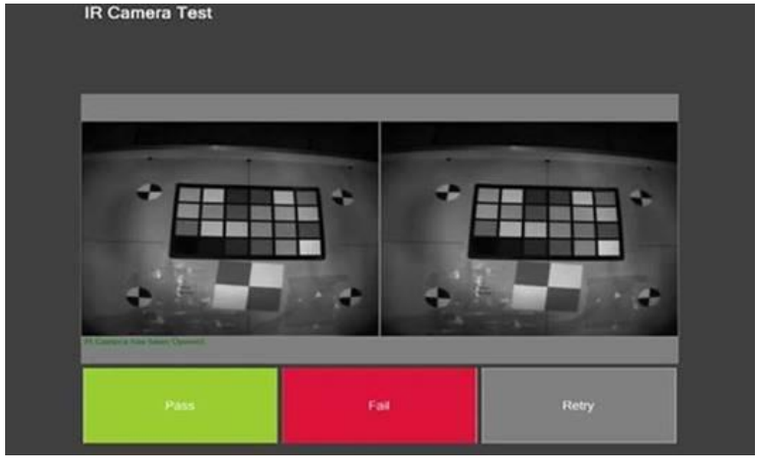


Image Quality Test Tool



System Functional Test Update

HLK

Windows Hello capable devices must pass the camera or fingerprint tests to obtain a signed driver

NEW!

Windows Hello – Proximity Lock

Never worry about locking your computer as you walk away from it. With “Proximity Lock”, your computer simply figures out if you're there or not and automatically locks itself in your absence, such as with Bluetooth, among other future protocols.

Simple customer experience

Pair your phone with your device using Bluetooth – Once paired, enabled by default

Device locks upon losing Bluetooth signal

Additional Bluetooth setting – On/Off

Investigating slight delay to lock as you walk / lose signal

Scaling Windows Hello

Include Windows Hello biometrics everywhere

Every device you're planning should have a biometric sensor

Face and / or fingerprint

Face offers the most modern experience and delivers a delightful "WOW!" factor

Offers a competitive differentiator to other platforms

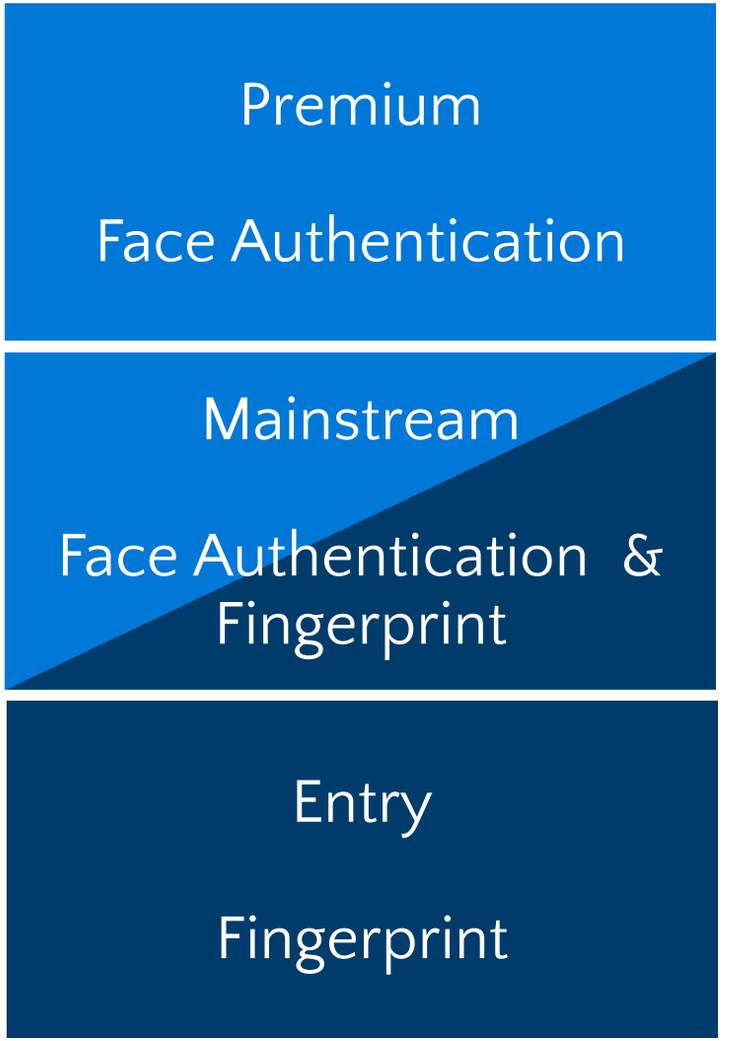
Get it right for your target customer

Touch / tap versus swipe fingerprint

Touch has become the most familiar experience because of use on mobile – considered "today's" technology

Swipe costs less, but is considered yesterday's technology that was rarely used because of poor experience

We see a 25% efficiency improvement with touch / tap over swipe



Ecosystem Engagement

Ecosystem has demonstrated that success can be engineered

Partners are innovating – new designs and form factors are emerging

Test processes are in place to hit user experience metrics, telemetry is trending up!

Cost efficiencies are occurring – MIPI, hybrid, etc.

Devices (Illuminated IR modules and systems) exit criteria

Pass Spec Validation and Image Quality (IQ) testing

- Validated by matching and passing OEM and Microsoft IQ test results

Exit criteria: Meets or exceeds 1/100K FAR @ 95% TAR requirements

Verified via face data capture and validation testing

Test Date	Version	Filter	Frame Pairing	Concurrent	Uniformity	Gamma	Gamma Contrast	Texture Acutance	Relative Illumination	Distortion	RGBSNR	Ambient	Saturation	IRSNR		MTF 50	MTF 50		MTF Overshoot/Undershoot	
mm/dd/yyyy	Specification	30 nm+-	Pass/Fail	RGB & IR Concurrent Access	< 65% @ Mid-range	Pixel to Reflectivity R^2 > 0.98	120	SQF >40	Relative Illumination >45%	<5.5%	>18dB @ 10 Lux	Incandescent light For ALS (Ambient Light Subtraction) test	face in illuminated frame can't be saturated @ near/far range	> 30/26/22 Full FOV @ far range		.25 < cy/pxl @ 50cm	.25/.20 < cy/pxl @ far range		< 5% / 3% @ far range	
														Center	Corner	Center	Center	Corner	Overshoot	Undershoot
11/30/2016	v1006	Yes	Pass	Pass	37.70%	0.9808	180	79.67	46.50%	0.34%	32.35	0Lux	Pass	42.415	34.757	0.267	0.27	0.267	2.40%	0.30%
												50Lux	Pass	37.567	28.646	0.264	0.262	0.263	2.40%	0.40%
												150Lux	Pass	36.276	24.511	0.272	0.27	0.247	2.60%	1.20%
												450Lux	Pass							

While IQ metrics continue to evolve, the exit criteria remains the same

Ecosystem Roles & Responsibilities

Microsoft	IHV	OEM / ODM
Secure operating system	High performance optics, sensor selection, IR illumination module	Properly specified system
Hardware specifications	Camera and component design and verification	Performance verification
Recognition algorithm	ISP tuning	Camera module integration
Ambient light subtraction	Driver development	System hardware integration and validation
Anti-spoofing counter measures		

Microsoft

Getting Windows Hello everywhere

Driving to scale… begins with well engineered systems

Work we are doing to drive volume

Qualify high quality module designs that meet OEM requirements

Enable cost saving components lead to a reduction in BOM

Drive continued reduction in module size for thin bezel designs

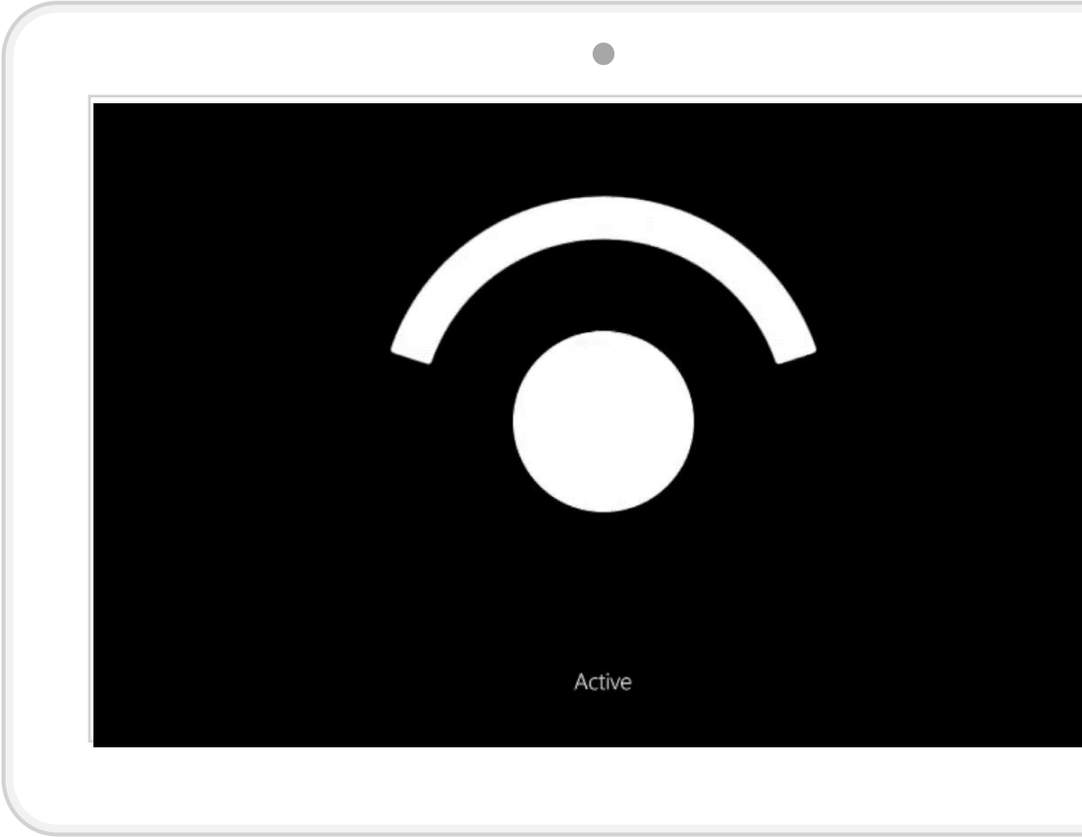
Tireless support for enhanced security

Keys to success

System designs that meet or exceed design requirements

Image quality test and verification

Field test of real faces in real environments



Getting Windows Hello everywhere

☆ **GOAL**
Enable the hardware ecosystem to develop and integrate low cost IR solutions at scale using Pre-Qualified Parts.

Scale Program is now live

All new systems launching/refreshing beginning September 2016 must meet v2.x spec

All new systems launching/refreshing (e.g. Chassis change) and pre-installing the Creators Update must meet v3.x spec

All new submissions that plan on shipping June 2017 or later must be multi-spectrum capable for enhanced authentication and improved performance for commercial customers.

Objectives

Continue to expand pre-qualified parts list to provide more solutions to meet OEM needs

Continue to provide ecosystem partners (OEMs, IHVs, ISPs) documentation, process and tools necessary to deliver solutions meeting performance and security requirements

Help to reduce the test burden for systems using Pre-Qualified modules

Windows Hello Everywhere – IHV Process

Microsoft pre-qualifies camera modules

- Microsoft performs all module testing and validation (IQ and Field Test)
- Microsoft validates driver quality
- Microsoft qualified camera module published on Pre-Qualified List and available to all OEMs

Pre-Qualified IR modules have been fully tested by Microsoft to meet or exceed:

- Windows Hello (Face Authentication) hardware requirements
- Established Image Quality (IQ) Key Performance Indicators (KPIs)
- 1/100K False Accept Rate (FAR), 95% True Accept Rate (TAR)

Microsoft End-to-end Validation includes

- Image Quality (IQ) testing
- 1,200 Face capture field test
- Basic usability testing
- Anti-spoofing testing/data capture

Windows Hello Everywhere – OEM Process

OEM selects pre-qualified module

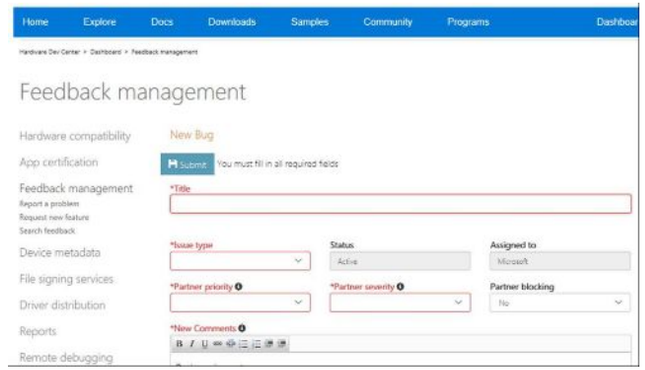
- Pre-qualified modules are listed on the Pre-qualified parts list (PQL) published to Connect
- Microsoft performs all module testing & validation on PQL parts including image quality (IQ) & field testing

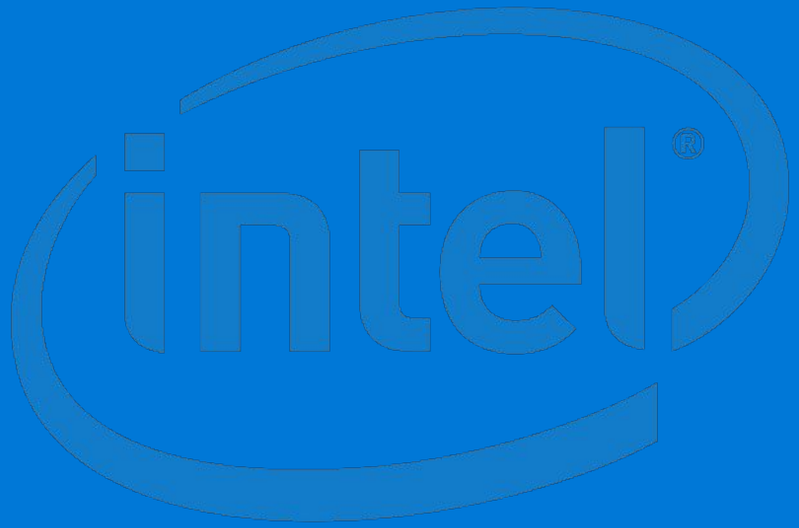
OEM self-validates the system with module from the PQL

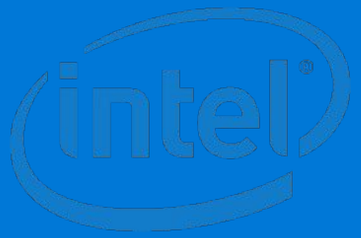
- OEMs perform limited testing including IQ, Hardware Lab Kit (HLK)
- OEMs follow system integration requirements as documented in latest specification document published on MSDN
- Submits results via SysDev portal

Non-qualified OEM devices

- Non-qualified devices will not be supported
- Not eligible for driver signing in Windows (Creators Update Requires)
- Modules with unsigned drivers will be disabled
- Not eligible for Microsoft marketing programs and assets




intel

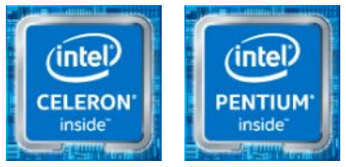


PureIR Module

for Windows Hello face authentication

Intel® Turnkey Program

A ready-to-go, flexible, pre-certified, turnkey solution enabling fast time to market



CUSTOMIZABLE REFERENCE DESIGN

Modern PC Features

Quality & Certification

Master Reference Design

Tools

Component Catalogue

SUPPORT MODEL

Customer Support

Factory Support

ODM

IDH

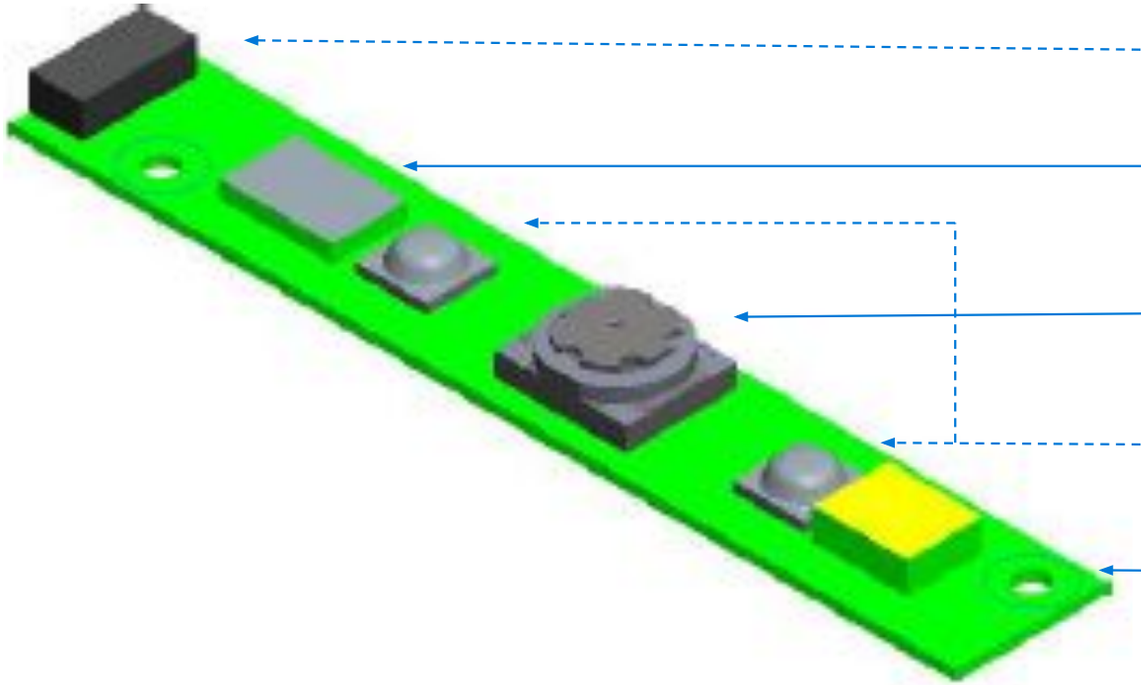
SI

OEM

LOEM

PCBA vendors

The PureIR module for Windows Hello face sign-in



- USB 2.0 Connector
- Image Processor
- IR Camera
- 2 IR LED’s
- NOR Flash

Partnerships for the best user experience

Microsoft	
OmniVision	OV7251: **Global shutter sensor, zero exposure lag** no motion blur, no rolling shutter side effects
OSRAM	IR-LED SFH4715AS **Power efficient with high luminance**
REALTEK	ISP5841, Mipi-in-USB2.0-out, **cost effective** **Tuned for Windows Hello face authentication**
AOET 先進光電科技股份有限公司 Ability opto-Electronics Technology co.Ltd	**Proven Lens** 1AC0985H

Key benefits: High quality and fast TTM

	▪ Pre-qualified as a module ▪ Performance critical functions (such as tuning) integrated
Creators Update / V3.0 ready	▪ The module is validated against the 3.0 specification for Creators Update ▪ Can be combined with wide range of RGB camera options, USB or MIPI
Easy to integrate	▪ Small size enabling attractive ID's ▪ System level tests completed on Intel® Master Reference Design ▪ Comes with system integration guidelines (optical, thermal, mechanical, ..)
Works with any Intel® platform	▪ The module can be used with any Intel platform: Atom, Celeron, Pentium or Core™ (USB)
Cost Effective	▪ Initial quote is $8

Ready to intercept your Intel® based products now

Future Roadmap:

Combined RGB/IR sensor based module

Further cost down

MIPI modules

Now:

Ready to intercept your Intel® based products with the PureIR module for Windows Hello face sign-in

Contact your Intel® account team for more details

Who could say no to that 

Windows Hello isn't limited to accessing your PC, soon your favorite websites and apps will unlock with a look, touch or just by entering the room. Do great things.

Windows

Scaling Windows Hello

Windows Hello Everywhere – OEM Process

Fingerprint

There is a review process that is required to get a Windows Hello device driver published to Windows Update

The review / approval process for Windows Hello fingerprint is published on Connect.

The following IHVs have completed all the necessary reviews for Windows Hello fingerprint approval:

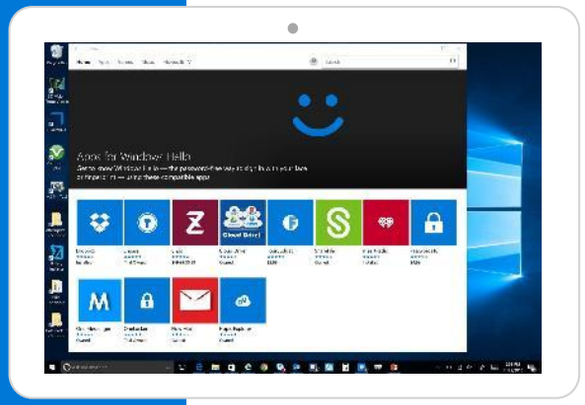
CDF

CDF enables you to use a device such as a phone or smart watch to quickly sign-in to your PC without using a password

Requires an app from the partner device maker to be installed on the PC to manage the interaction

The CDF review process is done through the store submission process when the partner app is submitted

Windows Hello Apps & Sites



Apps

New section in the Windows Store

Tailored by location

Web

FIDO 2.0 Specification

Microsoft Edge support will launch once spec is ratified

Will enable site login and payment

Currently Shipping Face Authentication Devices

Grandfathering Policy

As documented, Windows 10 systems using 2.x modules can continue to ship with the Creators Update as long as they do not go through a chassis change.

Systems that transition to Kabylake should send in updated IQ results if they are using a MIPI module so we can help ensure the customer experience holds true.

2.x parts that are multi-spectrum capable* can continue to ship on devices without a chassis change through the release after the Creators Update.

3.0 qualified devices may reduce illumination power to meet the 3.1 HW Specification

*For commercial devices, we highly recommend multi-spectrum concurrency on shipping parts to support the enhanced security needs of commercial customers.

No new 2.x submissions will be accepted after 3/1/2017.

Wrap up

Recap – Deliver a great Windows Hello experience

Plan for biometrics in all of your devices

Follow the specs and use components from approved IHVs for both face authentication and fingerprint sensors

Design for success

Use the Windows Hardware Guidance for Delightful Face Authentication Scenario 3.x specification and test using the latest Image Quality Testing Guide to plan future systems

Ensure IR modules provide ample IR Illumination for environments with high ambient light

Provide a sufficient field of view (FOV) for quick and natural enrollments and device authentications

Enable concurrent RGB – IR device access support

Migrate to FrameServer based driver designs

Embrace innovation and deliver customer value

Influence future PQL modules by providing Microsoft & your IHVs w/ your design requirements

Ensure sufficient resource and test time is built into system schedules resources/time to meet V3.x spec

Test your device upgrade with Creators Update to verify the driver works with the new driver signing process

Beyond the System

Support Windows Hello on your apps & websites

Apps: Enable apps you create or preinstall to work with Windows Hello anywhere your customer is required to authenticate.

Websites: Start investigations into building a FIDO server that will support password-less login scenarios.

Work with Microsoft to build an end to end proof of concept to demonstrate passwordless authentication for Edge.

R0 G120 B215
Hex #0078D7
C100 M30 Y0 K0
PMS 3005

Showcase Windows Hello in your marketing communications

In your ads
In your product descriptions & materials
In the retail experience – Now in the Retail Demo Experience (RDX)

Resources

Requirements, testing and implementation guidance kits are available on Connect

Windows Hello Face Authentication Partner Kit

Windows Hello Fingerprint Authentication Partner Kit

Windows Hello Companion Device Framework Dev Kit

Windows Hello FrameServer Implementation Kit

App / Website Developer links

Enabling Windows Hello authentication in your apps

Bring up a FIDO server to support password-less login with Windows Hello

Build a Microsoft Edge proof-of-concept to support Windows Hello

App / Website Developer links

Face Capture Tool

System Functional Test Update

HLK tools

Please provide feedback or questions through Dev Center or contact winhec@Microsoft.com

Microsoft

Thank You
谢谢

Please follow WinHEC @ WinHEC.com