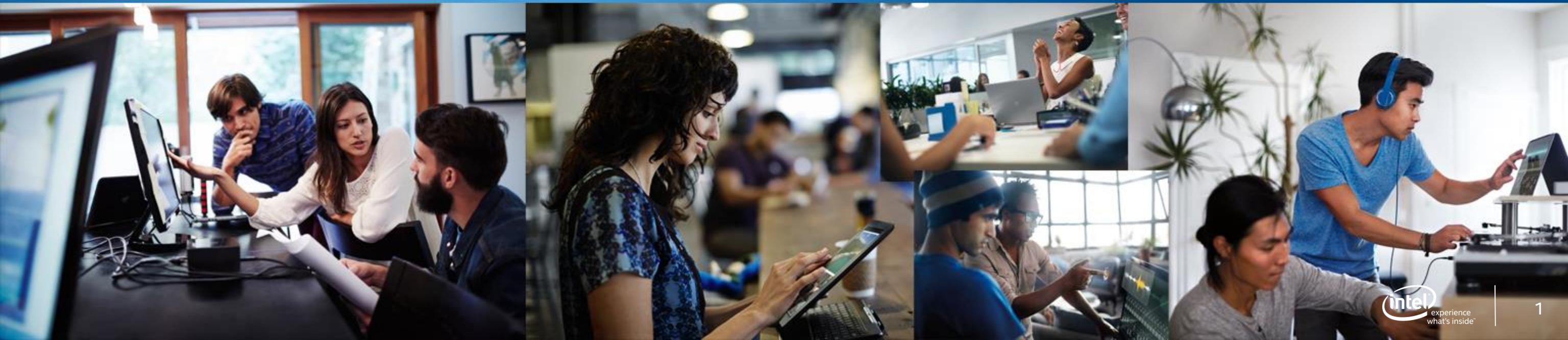
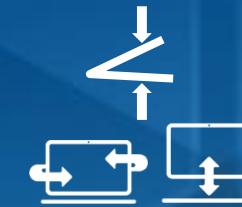




## 7TH GEN INTEL® CORE™ & INTEL® XEON® PROCESSOR BRIEFING



# WHAT WE TALKED ABOUT IN AUGUST '16



## New Processors and Designs

New processors from 4.5W-15W

Amazing 2 in 1 computers and ultrathin laptops for consumer and small business

>100 designs in Q4'16



## Performance Leadership

Work, multitask, create  
**1.7X<sup>1</sup> – 15X<sup>2</sup> faster**



## Bringing 4K UHD Mainstream

"All Day 4K" battery life (9.5hr)<sup>3</sup>  
Premium 4K UHD content on your computer



## Feature Rich

**120+** Thunderbolt™ 3  
**100+** Windows® Hello  
**50+** 4K UHD  
**25+** Pen designs

1. As Measured by SYSmark® 2014 Overall Score (Intel® Core™ i5-7200U vs. Intel® Core™ i5-2467M)  
2. As Measured by MAGIX Fastcut Video Create Workload (Intel® Core™ i5-7200U vs. Intel® Core™ i5-2467M)  
3. Based on 4K HEVC 10-bit local video playback on Intel® Core™ i7-7500U at 66WHR battery and 4K panel

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit <http://www.intel.com/benchmarks>

# WINDOWS\* 10 RUNS BEST ON THE LATEST INTEL CORE PROCESSORS

## Performance + Responsiveness

Intel® Speed Shift Technology  
Modern Standby\*  
Intel Optane memory



## User Experiences

Windows\* Hello  
Cortana\*  
Intel® Smart Sound Technology



## Gaming + Entertainment

PlayReady 3.0\*  
Xbox\* Play Anywhere  
HEVC 10-bit & VP9 Decode/Encode



## Productivity

Intel® Core™ vPro™  
Thunderbolt™ 3  
Microsoft\* Office  
Windows\* Ink



## Security

Intel® Secure Key  
Intel® Authenticate  
Device Guard\*  
Windows\* Hello for Business



## Manageability

Intel® Core™ vPro™  
Technology  
Intel® Active Management Technology





# DEVELOPING THE FUTURE TOGETHER



Microsoft



MIXED REALITY  
& GAMING

IMMERSIVE

PROJECT  
EVO

ALWAYS CONNECTED



“Hey, Cortana”

ARTIFICIAL INTELLIGENCE

BETTER SECURITY<sup>1</sup>



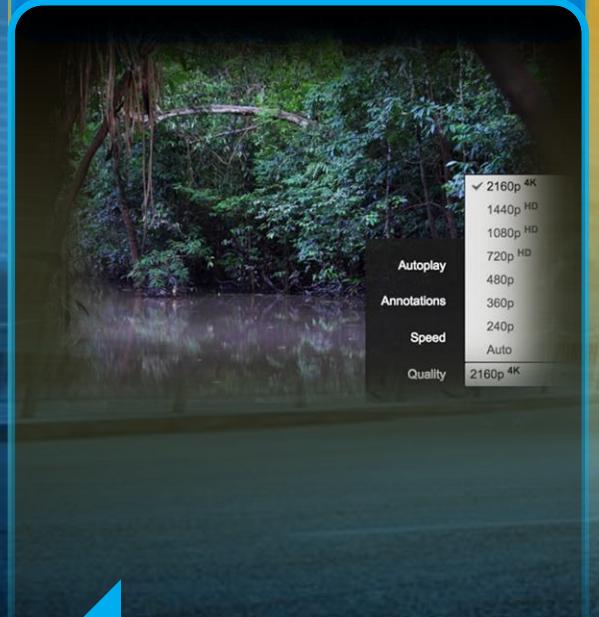
Intel Authenticate

# WELCOME TO THE IMMERSIVE INTERNET

7th Gen Intel® Core™ processors bring the immersive internet to life on PCs, from thin and light 2 in 1 computers to powerful desktop PCs and All-in-One computers

STUNNING • SENSORY • ACTIVE • ENGAGING

4K UHD



ESPORTS



VR



360° VIDEO



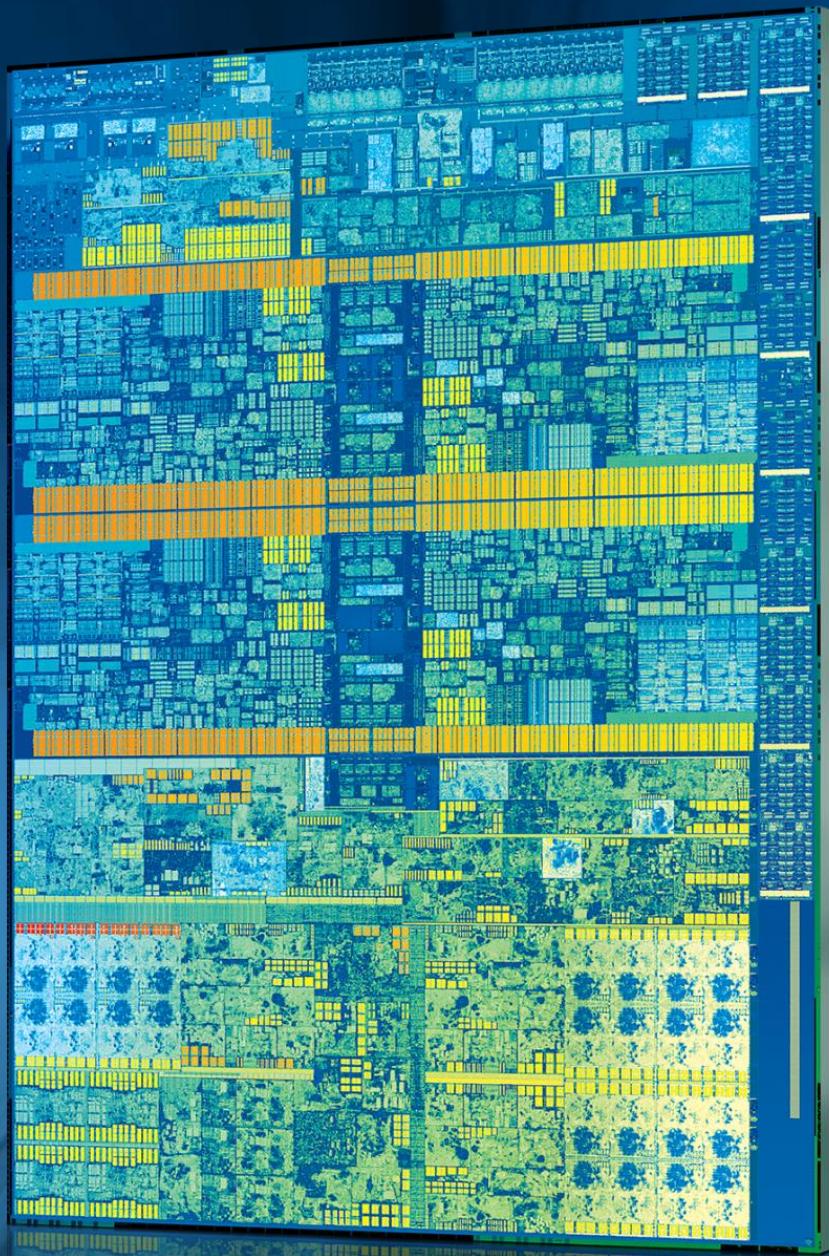
PC IS TRANSFORMING THE IMMERSIVE INTERNET EXPERIENCE

# NEW PROCESSORS POWERING HIGH PERFORMANCE COMPUTING

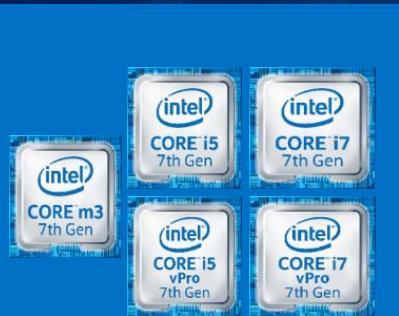
## INTEL® CORE™ & INTEL® XEON® PROCESSORS

LAUNCHING JANUARY 3RD

- 7<sup>th</sup> Gen Intel® Core™ processors from 4.5W-91W
  - 7<sup>th</sup> Gen processors with Intel® Iris™ Plus graphics
  - Processors with Intel® vPro™ technology
  - Intel® Xeon® processors for mobile workstations
- 
- Consumers: enthusiast laptops and desktops, minis, and All-in-One computers
  - Business: 2 in 1 computers, ultrathin laptops, mobile workstations, desktops, minis, and All-in-One computers



# BROAD RANGE OF DESIGNS



## Y-SERIES

2 in 1  
Detachables,  
and Compute  
Stick



## U-SERIES

Thin and Light  
Laptops, 2 in 1  
Computers,  
Convertibles,  
and Minis



## H-SERIES

Performance  
Laptops and  
Mobile  
Workstations



## S-SERIES

Desktop  
Performance  
to Value, All-in-  
One Computers  
and Minis



Consumer and Business



# GET THE GRAPHICS PERFORMANCE YOU EXPECT WITH INTEL® IRIS™ PLUS GRAPHICS



## Game

Better 3D  
graphics  
performance

**~65% BETTER<sup>1</sup>**

vs. Intel® HD graphics



## Create

Better Quick  
Sync Video

**~40% BETTER<sup>2</sup>**

vs. Intel® HD graphics



## Entertain

Enjoy premium  
content

**4K**

## DELIVERS PERFORMANCE FOR TODAY'S CREATORS

1. As Estimated (e) by 3DMark\* Sky Diver  
Graphics Score (Intel® Core™ i7-7500U  
vs. Intel® Core™ i7-7567U)

2. As Estimated (e) by TouchXPRT\* 2014  
Convert Video Subtest (Intel® Core™ i7-  
7500U vs. Intel® Core™ i7-7567U)

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Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit <http://www.intel.com/benchmarks>

# 7<sup>TH</sup> GEN INTEL CORE H-SERIES PROCESSOR FAMILY



## Productivity

Double digit productivity improvement

UP TO 20% BETTER<sup>1</sup>



## Create

Quickly and effortlessly create, stitch, and share 4K 360 videos

UP TO 65% FASTER<sup>2</sup>



## Game

Unleash the performance to game and stream simultaneously in real time

OVERWATCH/TWITCH

## AMAZING PERFORMANCE IN A MOBILE FORM FACTOR

1. As Measured by SYSmark\* 2014 (Intel® Core™ i7-7700HQ vs. Intel® Core™ i7-4700HQ)

2. As Measured by 4K 360 Kolor Autopano Workload (Intel® Core™ i7-7700HQ vs. Intel® Core™ i7-4700HQ)

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# 7<sup>TH</sup> GEN INTEL® CORE™ S-SERIES PROCESSORS

## FANTASTIC PERFORMANCE WITH UNLOCKED<sup>3</sup> PROCESSORS



### What's New

Intel® Core™ i3-7350K

Intel® 200 Series Chipset

Intel® Optane™ memory

Intel® Authenticate  
general availability



### Productivity

Double-digit  
performance  
gain

**25% BETTER<sup>1</sup>**



### Create

Create, stitch,  
and share 4K  
360 videos

**35% FASTER<sup>2</sup>**



## LEAPS IN PERFORMANCE COMPARED TO 3-YR-OLD COMPUTER

3. Altering clock frequency and/or voltage may cause damage to or reduce the useful life of the processor and other system components and/or reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with manufacturers of other system components for warranty and additional details. For more information, visit: <http://www.intel.com/content/www/us/en/gaming/overclocking-intel-processors.html>

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors.  
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1. As Measured by SYSmark® 2014 (Intel® Core™ i7-7700K vs. Intel® Core™ i7-4770K)

2. As Measured by Adobe Premier Pro Workload (Intel® Core™ i7-7700K vs. Intel® Core™ i7-4770K)

# GETTING READY FOR INTEL'S REVOLUTIONARY MEMORY

## INTEL® OPTANE™ MEMORY READY

### Intel® Optane™ Memory



**Snappy Responsiveness**  
Snappy PC experience with short boot times and fast application launches

**System Acceleration**  
Accelerate day-to-day tasks

**High Speed and HDD Capacity**  
Pair Intel® Optane™ memory with an HDD for SSD-like speed and HDD capacity



### Intel® Optane™ Memory Ready



For partners and customers to promote desktop motherboards and systems equipped with M.2 connector that supports addition of Intel Optane memory purchased aftermarket

# OVERCLOCKING CAPABILITIES ENTHUSIAST USAGES

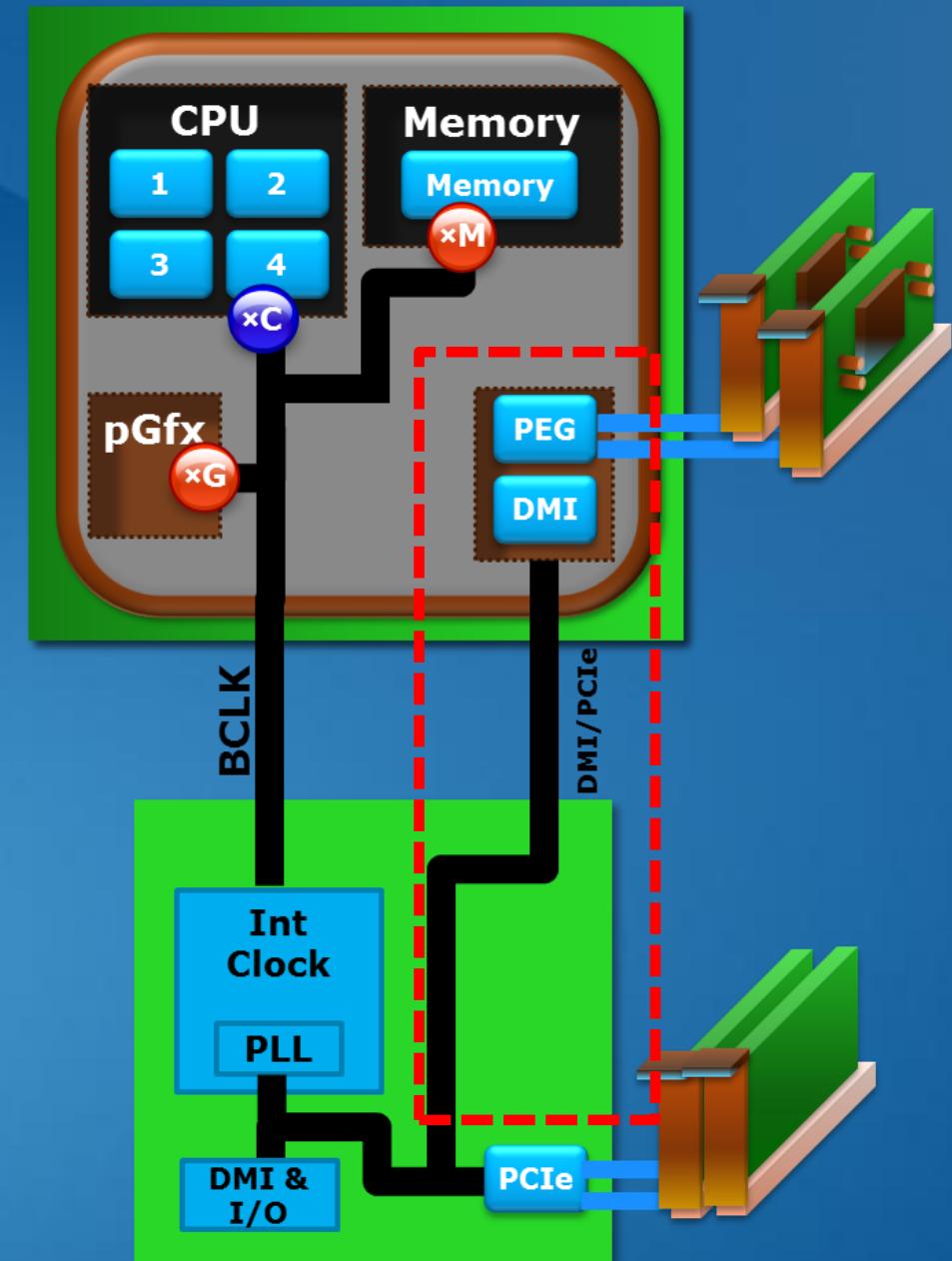
7<sup>th</sup> Gen Intel Core processors overclock to higher levels than previous generations

## B Clock Aware Voltage/Freq Curve

- Optimized voltage
- Improve overclocking stability and reliability
- Simplified overclocking voltage control

## AVX Offset Ratio

- More stable overclocking
- Higher OC non-AVX2 frequency



Altering clock frequency and/or voltage may cause damage to or reduce the useful life of the processor and other system components and/or reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with manufacturers of other system components for warranty and additional details. For more information, visit: <http://www.intel.com/content/www/us/en/gaming/overclocking-intel-processors.html>

# INTEL® CORE™ PROCESSORS POWER THE GAMING EXPERIENCE

GAMING FOR ALL TYPES OF CONSUMERS AND EXPERIENCES FROM THE CASUAL ON-THE-GO TO PROFESSIONAL PLAYER



U series with  
HD graphics



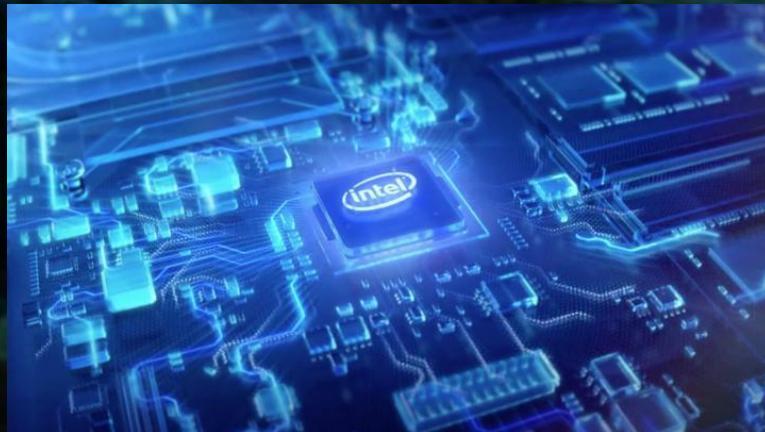
U series with  
Iris Plus graphics



H/S series with Discrete Graphics



# BRINGING REALITY TO VIRTUAL REALITY



Dynamic Environmental & Particle Effects



Object Persistence



Increased particle Physics



Enhanced Global Illumination  
17 Version

**intel® REALSENSE™**  
TECHNOLOGY

**THUNDERBOLT™**

**WG**<sup>TM</sup>  
Wireless Gigabit Alliance

**INTEL® OPTANE™ TECHNOLOGY**

**intel**

# VIEW 4K PREMIUM CONTENT ON 7TH GEN INTEL® CORE™ PROCESSORS

Enjoy the best 4K premium content on 7th Gen Intel® Core™ processors at home or on the go



Netflix\* 4K UHD premium content is available on 7th Gen Intel Core based systems. People will be able to enjoy 4K UHD TV shows and movies such as *The Crown* and *Stranger Things* on their computer at home or on the go.

AVAILABLE NOW



ULTRA, powered by SonyPicturesStore.com, is a premium streaming service with 4K UHD movies and TV shows from Sony Pictures, available with select 7th Gen Intel Core processor based computers in 2017.

COMING SOON IN 2017



FandangoNOW\* offers more than 40,000 new release and catalog movies, next-day TV shows, and an extensive library of 4K and HDR titles, to buy or rent -- no subscription required. FandangoNOW\* will be available on 7th Gen Intel Core processor based computers in 2017.

COMING SOON IN 2017



iQIYI\*, China's largest online video services provider, plans to release premium 4K UHD content on 7th Gen Intel Core processor based computers in 2017. It will be available to tens of millions of iQIYI's paid subscribers in the form of movies, TV series, variety shows and cartoons.

COMING SOON IN 2017

# PROTECTION<sup>1</sup> BUILT-IN TO THE SILICON

Designed to provide consumers with built-in security<sup>1</sup> features like convenience of logging into your computer with Windows\* Hello and extending the simple and secure<sup>1</sup> login throughout your browsing session with hardened password managers, and hassle-free secure<sup>1</sup> payments

## Fingerprint Touch to Pay & Secure<sup>1</sup> Guest Checkout

Greater confidence for low-risk transactions, secure<sup>1</sup> payments with the touch of a finger



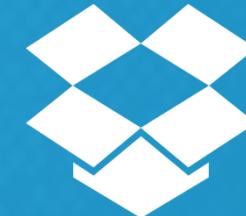
## Hardened Password Managers

Sensitive authentication data is captured, encrypted, matched and stored in hardware



## Built-in 2-Factor Authentication

Simple built-in two-factor authentication for Dropbox and other industry leading online services



Intel® Software Guard Extensions and Intel® Online Connect

1. Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. **No computer system can be absolutely secure.** Check with your system manufacturer or retailer or learn more at [\[intel.com\]](http://intel.com).

# BROADEST RANGE OF BUSINESS DESIGNS

Record 7th Gen Intel® Core™ vPro™ processor-based designs



90% of businesses run on computers  
powered by Intel<sup>1</sup>

>100 vPro designs across form factors



1. Source: Internal studies by Mercury Research, Inc. – PC processors and chip sets, Updated version 1Q2016; and IDC – WW Quarterly PC Tracker, 2016Q2 Historical Release

# AS WORKPLACE HAS TRANSFORMED SO HAVE THREATS

90% of incidents result from exploits in software<sup>4</sup>

>60%

Breaches involving identity<sup>1</sup>

\$5-15.6M

Cost per breach<sup>1</sup>

\$2.9B

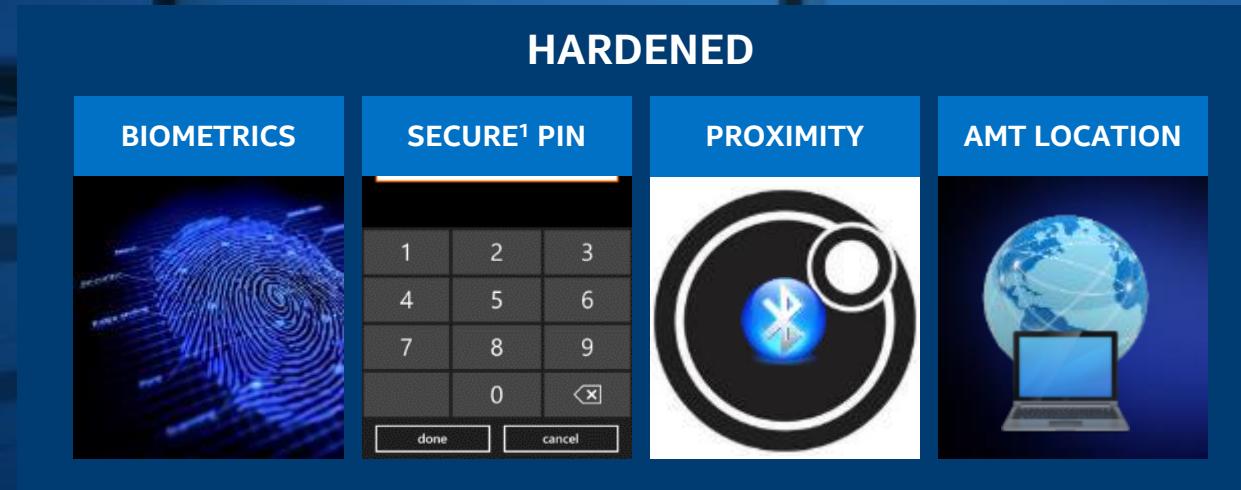
2015 damage to business & brand<sup>2</sup>

\$6T

Cybercrime damage by 2021<sup>3</sup>

# ANNOUNCING INTEL® AUTHENTICATE GENERAL AVAILABILITY

Industry's first hardware-enhanced multifactor authentication solution



1. No computer system can be absolutely secure

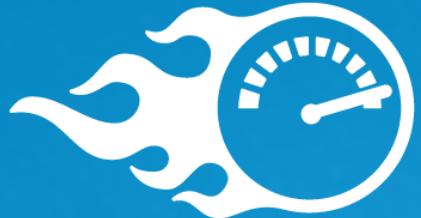
# NEW GENERATION OF PERFORMANCE & INNOVATION

## 7<sup>TH</sup> GEN INTEL® CORE™ PROCESSORS

### Intel's Newest Platforms

Innovation to drive exciting experiences, capabilities and form factors

#### Performance and Responsiveness



#### Fantastic Entertainment



#### Virtual Reality Experience



#### Fluid and Vivid Gaming



#### Content Creation



#### Security<sup>1</sup>

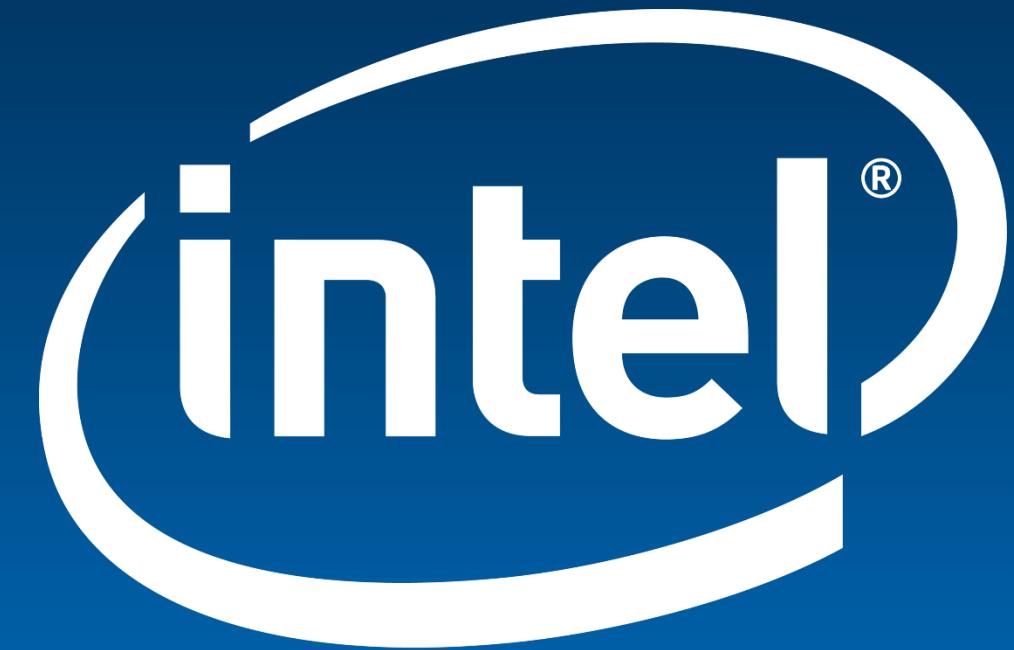


Better together with Windows\* 10

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1. No computer system can be absolutely secure



experience  
what's inside™

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\*Other names and brands may be claimed as the property of others.

(for data marked '(e)': Results have been estimated or simulated using internal Intel analysis or architecture simulation or modeling, and provided to you for informational purposes. Any differences in your system hardware, software or configuration may affect your actual performance.

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Intel is a sponsor and member of the BenchmarkXPRT Development Community, and was the major developer of the XPRT family of benchmarks. Principled Technologies is the publisher of the XPRT family of benchmarks. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases.

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# SYSTEM CONFIGURATIONS

Battery life and performance measurements on Intel Reference Platform unless otherwise noted

Intel Reference Platform is an example new system. Products available from systems manufacturers will not be identical in design, and performance will vary.

System power management policy: DC balanced for battery life measurements, AC balanced for performance measurements on 2<sup>nd</sup> Generation system and AC High Performance on 7<sup>th</sup> and 6<sup>th</sup> Generation systems. Wireless: On and connected.

## 7<sup>th</sup> Generation Measurements:

- Intel® CRB, Intel® Core™ i5-7200U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.1GHz, Memory: 2x4GB DDR4-2133, Storage: Intel SSD, Display Resolution: 1920x1080, Intel HD Graphics 620, OS: Windows\* 10 TH2
- Intel® Core™ i7-7500U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.5GHz, Memory: 2x4GB DDR4-2133, Storage: Intel SSD, Display Resolution: 1920x1080, Intel HD Graphics 620, OS: Windows\* 10 TH2
- Intel® Core™ i7-7567U Processor, PL1=28W TDP, 2C4T, Turbo up to 4GHz, Memory: 2x4GB DDR4-2133, Storage: Intel SSD, OS: Windows\* 10 Build 1607
- Intel® Core™ i7-7700HQ Processor, PL1=45W TDP, 4C8T, Turbo up to 3.8GHz, measured on: MSI\* Dominator Pro GT73VR, Graphics: NVIDIA\* GeForce GTX 1070, Memory: 16GB Kingston DDR4-2400, Storage: 256GB Samsung\* SSD, Display Resolution: 1920x1080 17", OS: Windows\* 10 RS1
- Intel® Core™ i7-7700K Processor, PL1=91W TDP, 4C8T, Turbo up to 4.5GHz, Motherboard: ASUS\* Z270, Graphics: NVIDIA\* GTX 1080, Memory: 2x8GB LPDDR4-2400, Storage: Intel SSD, OS: Windows\* 10 Build 1607

## Refresh Comparison Measurements:

- Intel® Core™ i5-2467M Processor (1.6 GHz base, up to 2.3GHz 2C4T, 17W TDP) measured on Dell\* XPS13-40002sLV 13" Ultrabook, RAM: 4GB DDR3, Storage: 128GB SSD, Display: 13.3" 1366x768 resolution, Battery: 46Whr, OS: Windows\* 7
- Intel® Core™ i7-4700HQ Processor, PL1=47W TDP, 4C8T, Turbo up to 3.4GHz, measured on: ASUS\* G750JZA, Graphics: NVIDIA\* GTX 880M, Memory: 2x4GB LPDDR3-1600, Storage: 256GB Sandisk\* SSD, Display Resolution: 1920x1080 17", OS: Windows\* 10 RS1
- Intel® Core™ i7-4770K Processor, PL1=84W TDP, 4C8T, Turbo up to 3.9GHz, Motherboard: H97, Graphics: NVIDIA\* GTX 1080, Memory: 2x8GB, DDR3-1600, Storage: Intel SSD, OS: Windows\* 10 Build 1607

## 4K UHD HEVC 10-bit Battery Life

- Intel® CRB, Intel® Core™ i7-7500U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.5GHz, Memory: 2x4GB DDR4-2133, Storage: Intel SSD, Display Resolution: 4K, Intel HD Graphics 620, OS: Windows\* 10 TH2, Battery: 66Whr

# WORKLOAD DESCRIPTIONS

**SYSmark® 2014** is a benchmark from the BAPCo® consortium that measures the performance of Windows® platforms. SYSmark tests three usage scenarios: Office Productivity, Media Creation and Data/Financial Analysis. SYSmark contains real applications from Independent Software Vendors such as Microsoft® and Adobe®. Reported metrics: SYSmark 2014 Rating and a rating for each scenario result (higher is better for all). Scaling efficiencies: CPU dominant, sensitive to frequency, core count and memory. QSV enabled.

**Windows 10® 4K 24fps 10bit HEVC Local Video Playback Component Average Power** Disconnect all USB devices, connect to a local WiFi access point and set the screen brightness to 200 nits (disable DPST, set brightness to 200 nits on a white background and enable DPST). Wait for 10 mins for the OS to completely idle. Launch Tears of Steel (4K H265 24fps) video using the Windows Movie & TV App. Measure and calculate average power for the duration of the video. Report 3 run median.

**MAGIX Fastcut Video Create Workload:** Using MAGIX® Fastcut - The workload video is a 9min 21sec, 3840x2106, ~59.9Mbps, 30fps, H.264, 3.89GB, .mp4 file. The “A Cold Place” template is applied and is exported using the UHD setting. The output video is a 38s, 3840x2160, ~59Mbps, H.264, .mp4 file.

**4K 360 Kolor Autopano Workload:** The workload consists of six 30 second videos. All of them have the following specs: 106MB, 1920 x 1440, 30Mbps, 47.952fps, H.264, .mp4 container. The output file is a 4096 x 2048, 30 fps, H.264, .mp4 container 360° video file.

**Adobe Premiere Pro CC 2015.1 Workload:** The project contains seven clips totaling 2 minute and 21 seconds of 4K H.264 MP4 footage recorded at a bitrate of approximately 80 Mbps. The input file sizes total 1.90 GB. The video stream is 3840x2160 (4K) in H.264 format with a framerate of 29.97 FPS. The audio stream is 1536 Kbps, 48.0 KHz, 16 bit Stereo in WAV format. The performance test measures the time to export the entire clip to a 4K H.264 MP4 format. The output is a high quality 4K video file.