



CES TECH DAY

LISA SU

PRESIDENT AND CEO

The RYZEN logo, featuring the word "RYZEN" in a bold, white, sans-serif font. The letter "Y" is partially enclosed by a circular brushstroke that transitions from orange to red.



RADEON  
VEGA

## CAUTIONARY STATEMENT

This presentation contains forward-looking statements concerning Advanced Micro Devices, Inc. (AMD) including but not limited to, the features, functionality, availability, timing, expectations and expected benefits of AMD future products including AMD Ryzen™ mobile CPUs with Radeon™ Vega GPUs, 2nd generation AMD Ryzen™ high-performance CPUs and 2018 “Vega” portfolio of GPUs; AMD’s X86 roadmap; AMD CPU performance goals; and AMD’s graphics architecture roadmap, which are made pursuant to the Safe Harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are commonly identified by words such as "would," "may," "expects," "believes," "plans," "intends," "projects" and other terms with similar meaning. Investors are cautioned that the forward-looking statements in this presentation are based on current beliefs, assumptions and expectations, speak only as of the date of this presentation and involve risks and uncertainties that could cause actual results to differ materially from current expectations. Such statements are subject to certain known and unknown risks and uncertainties, many of which are difficult to predict and generally beyond AMD's control, that could cause actual results and other future events to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. Investors are urged to review in detail the risks and uncertainties in AMD's Securities and Exchange Commission filings, including but not limited to AMD's Quarterly Report on Form 10-Q for the quarter ended September 30, 2017.



Great  
Products

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High-Performance  
Technologies

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OUR  
JOURNEY

Ambitious  
Goals

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Undaunted  
Determination

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Cloud

Medicine

Security

Automotive

Industrial



# HIGH PERFORMANCE COMPUTING

Gaming

Personal Computing

VR & AR

Machine Intelligence

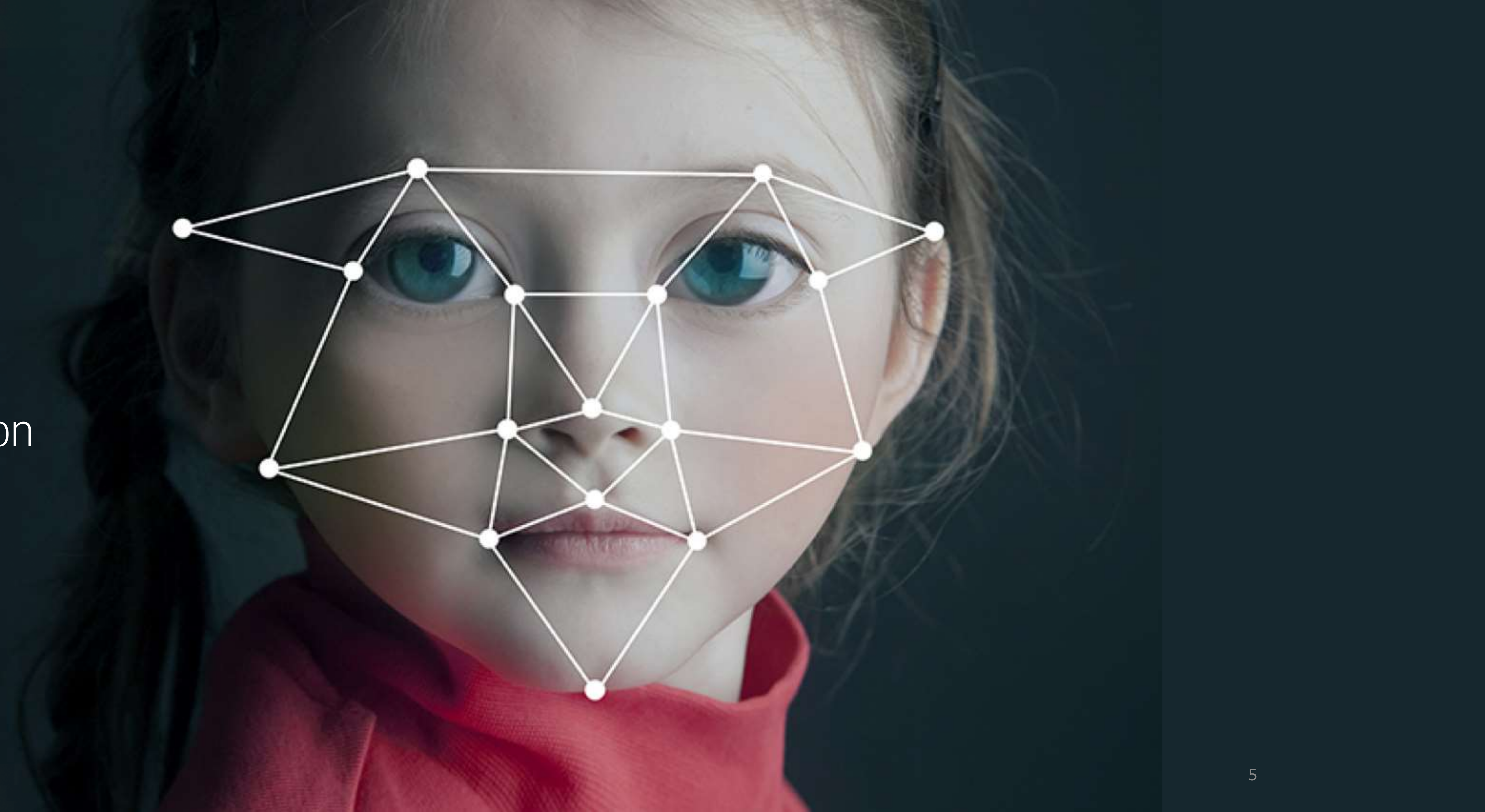
Financial Services

# IMMERSIVE EXPERIENCES REQUIRE **VISUAL** **COMPUTING POWER**

Voice, gesture, and face recognition

Super high resolution

Mixed and virtual realities





# THE EXPLOSION OF DATA DEMANDS MORE COMPUTE

Big data analytics

Machine learning

HPC

2017  
WE DELIVERED  
RECORD NUMBERS  
OF GREAT PRODUCTS

PCs



**Ryzen™, Ryzen™ PRO,**  
Ryzen Threadripper™,  
**Ryzen™ Mobile**

IMMERSIVE



**Radeon™ RX Vega,**  
Radeon 500 Series,  
**Xbox One™ X SoC**

DATACENTER



**AMD EPYC™ 1P**  
and 2P Platforms,  
**Radeon Instinct™**

GREAT  
PRODUCTS

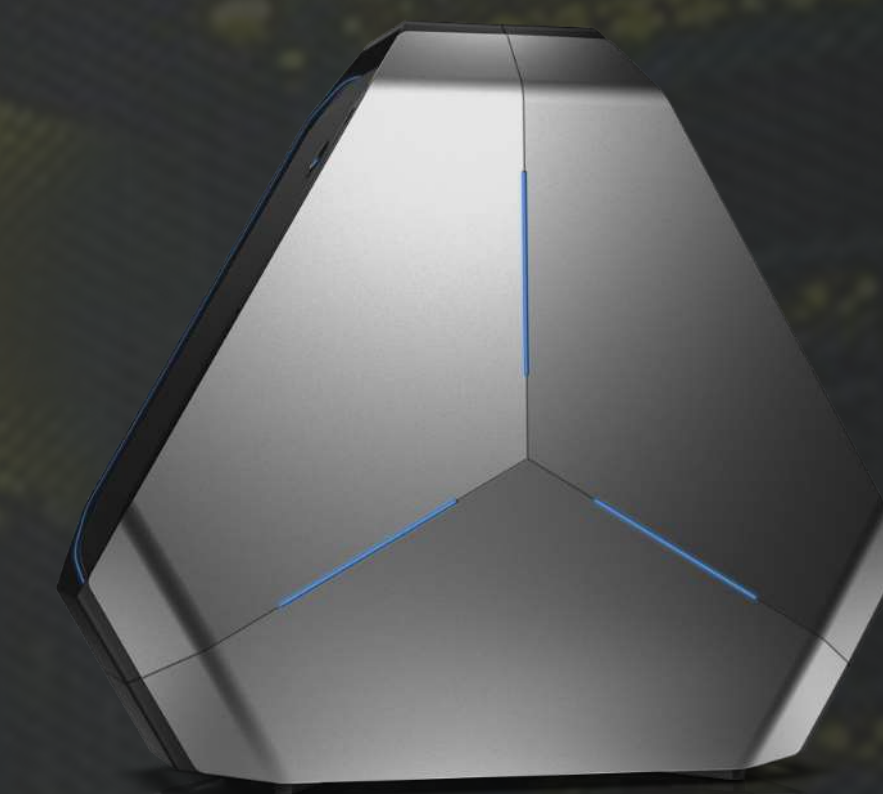
More Threads

More Features

More Performance



RYZEN



IN HIGH  
PERFORMANCE PCs

Data reflects Ryzen 7 1800X and the Ryzen 5 2400G desktop processors compared to comparable Intel parts, see Endnotes for details.

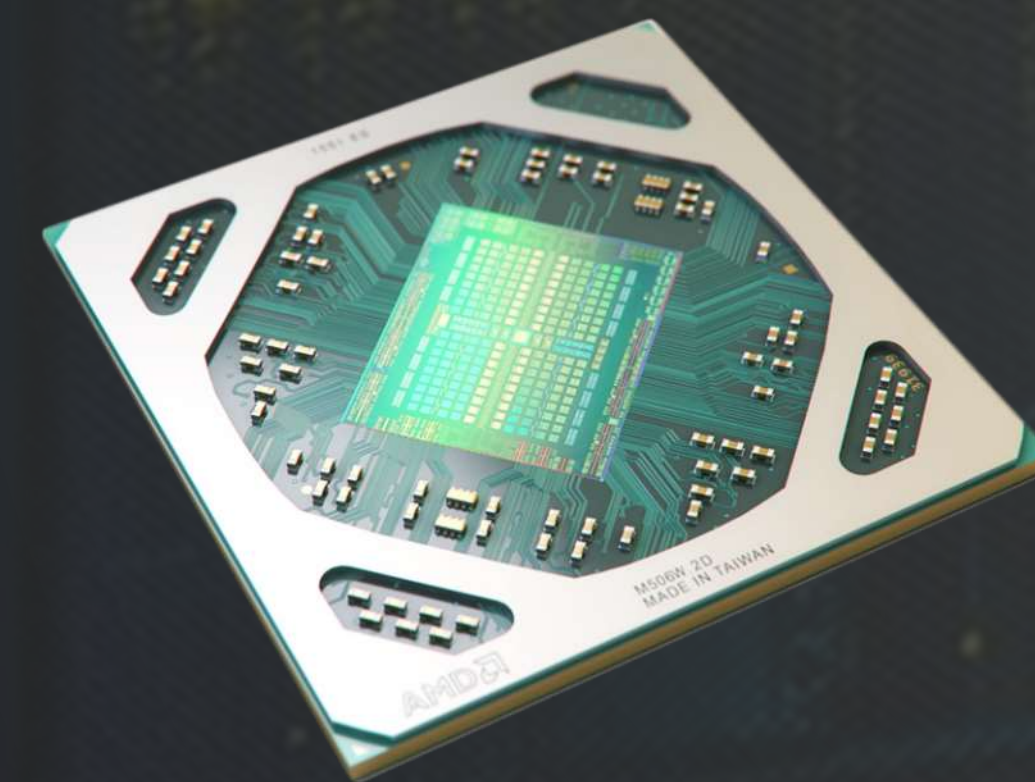
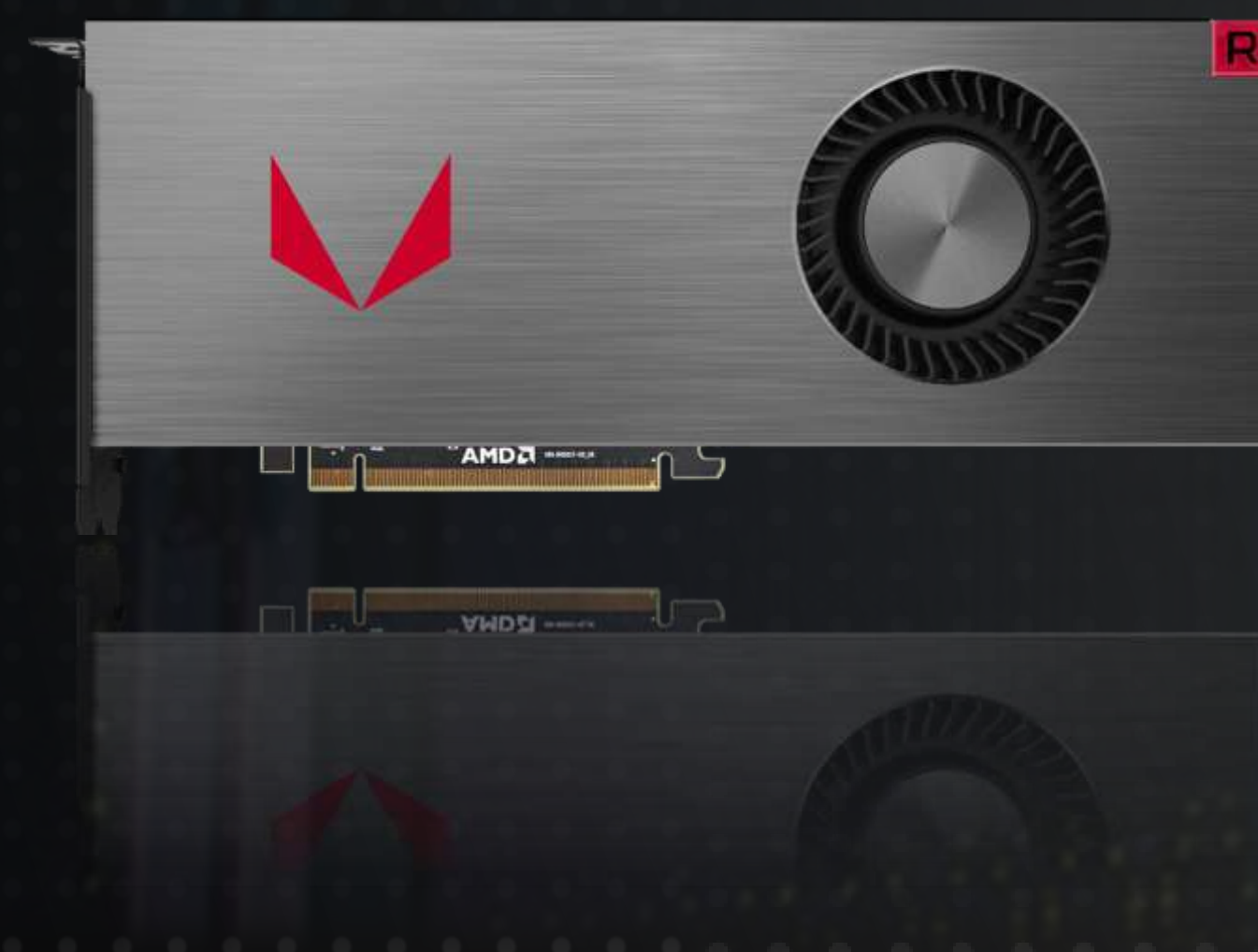


# GREAT PRODUCTS

More Performance

More Software

More Displays



IN HIGH  
PERFORMANCE  
GRAPHICS

Data reflects Radeon RX Vega 64 gaming performance compared to comparable Nvidia part; see Endnotes for details.

# GREAT PRODUCTS

More Cores

More I/O

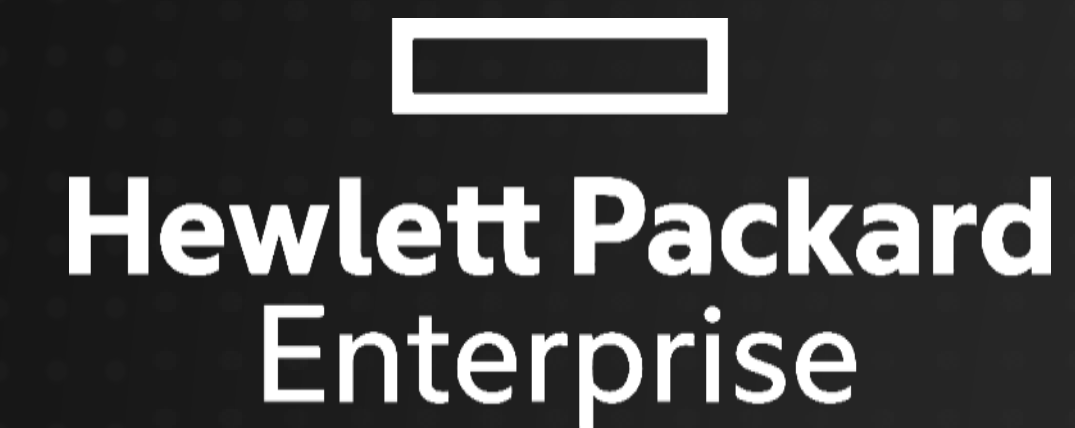
More Memory Bandwidth



## IN THE DATACENTER

Based on comparison of the EPYC 7601 vs. the Intel Xeon Platinum 8180. See Endnotes.

# EXPANDING CUSTOMER MOMENTUM



2018

CHANGING THE RULES OF

HIGH-PERFORMANCE COMPUTING



# WELCOME TO A HIGH-PERFORMANCE 2018

PCs



**New Ryzen™ CPU and APU Generation**

GRAPHICS



Expanding the Radeon™ Vega Family

TECHNOLOGY



Aggressive Technology and IP Roadmap

The Ryzen logo features the word "RYZEN" in a bold, white, sans-serif font. The letter "O" is replaced by a circular graphic with a gradient from orange to red, resembling a stylized sun or a paint stroke.

**RYZEN**

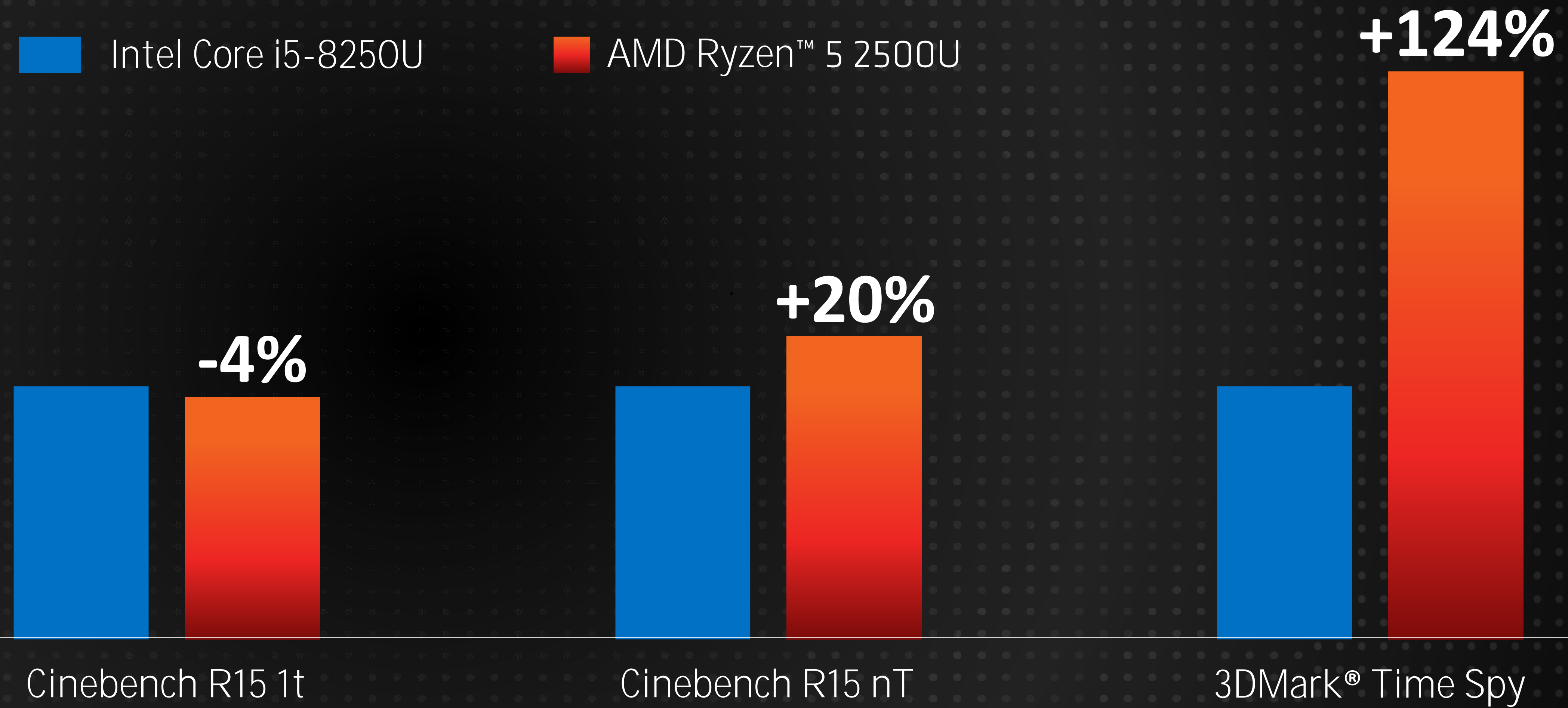
CHANGING THE RULES OF

HIGH-PERFORMANCE PCs

# LEADERSHIP MOBILE PRODUCT



Mobile Processor  
With Radeon™ Vega Graphics



Results may vary. See Endnotes

INTRODUCING AT CES 2018

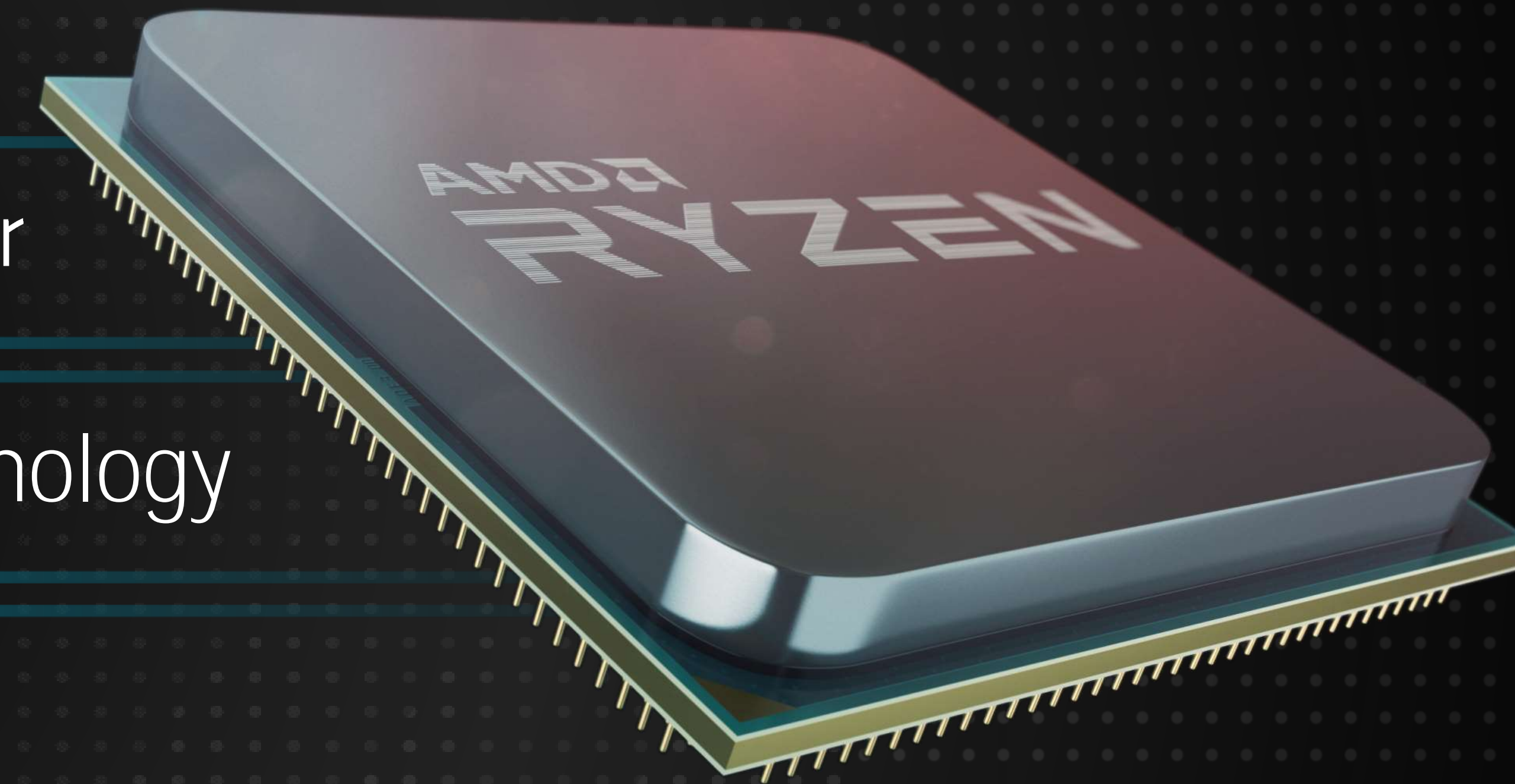
# RYZEN

2<sup>ND</sup> GENERATION  
HIGH-PERFORMANCE CPU

12nm "Zen+" Processor

Precision Boost 2 Technology

Launching April 2018



Dates subject to change



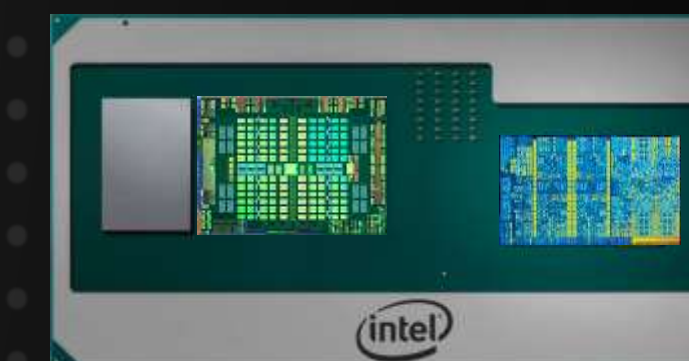


**RADEON**  
VEGA

CHANGING THE RULES OF  
HIGH-PERFORMANCE GRAPHICS

# AMD RADEON™ EVERYWHERE

GAMING PCs





\*AMD Internal Estimates

# 2018 “VEGA” GRAPHICS PORTFOLIO



**RADEON**  
VEGA

Premium Desktop

RADEON™ RX VEGA 56 AND 64

Premium Mobile

ANNOUNCING AT CES 2018

**RADEON VEGA MOBILE**

Machine Learning

ANNOUNCING AT CES 2018

**RADEON INSTINCT™ “VEGA” 7nm**  
RADEON INSTINCT MI25

ANNOUNCING AT CES 2018:

**RADEON™ VEGA MOBILE**  
DISCRETE GPU

1.7mm Z height and HBM2

Ultrathin performance gaming

Ultrathin workstations



**RADEON**  
VEGA

ANNOUNCING AT CES 2018:

# OUR FIRST 7nm PRODUCT

7nm Radeon™ “Vega” Architecture

Built for Machine Learning

Production-Level ML Software Stack





CHANGING THE RULES OF

TECHNOLOGY

# X86 ROADMAP LEADERSHIP

2017

**“ZEN”**

14nm

52% IPC

Uplift Delivered

2020

**“ZEN+”**

12nm

**“ZEN 2”**

7nm

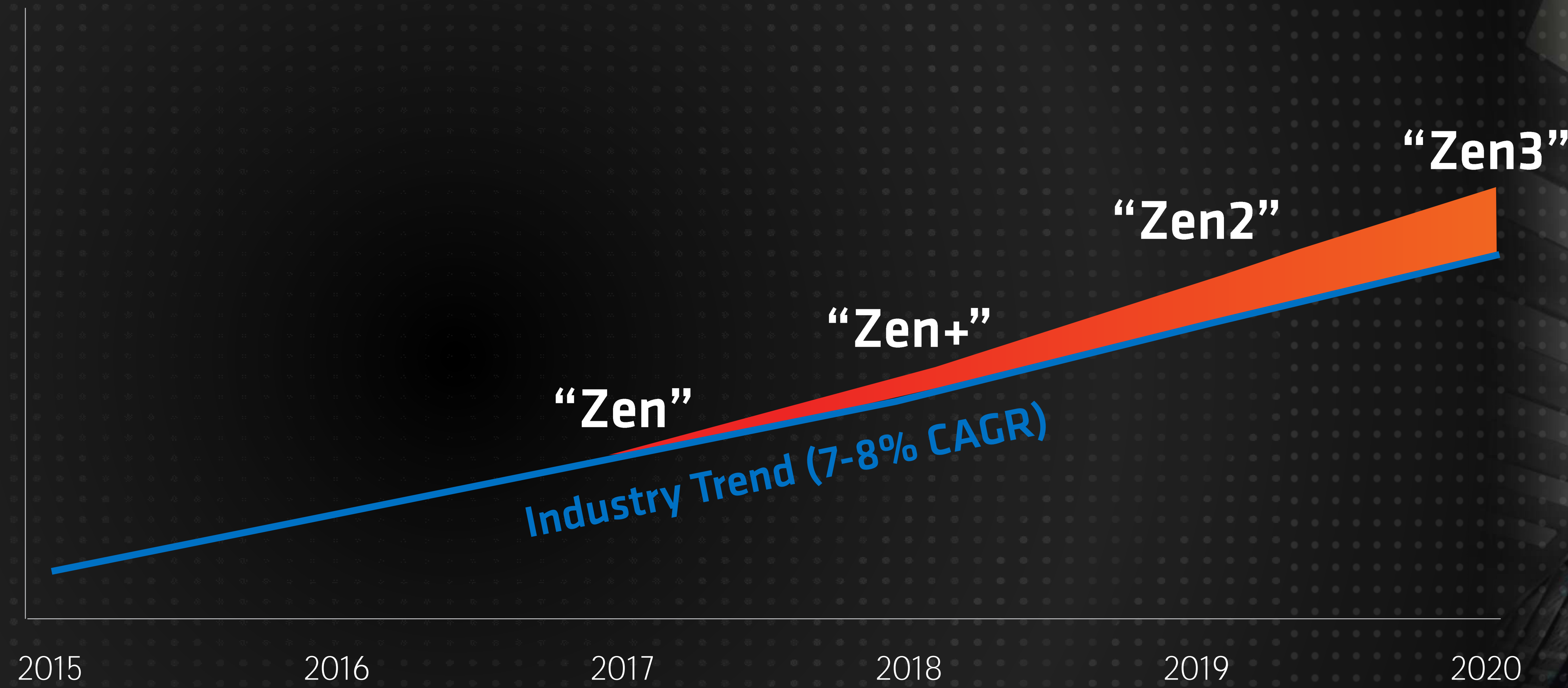
**“ZEN 3”**

7nm+

Roadmap subject to change



# AMBITIOUS CPU PERFORMANCE GOALS



# GRAPHICS ARCHITECTURE ROADMAP

2017

**“VEGA”**

14nm

**“VEGA”**

7nm

**“NAVI”**

7nm

**NEXT-GEN**

7nm+

2020

Roadmap subject to change



CHANGING THE  
RULES OF



RADEON  
INSTINCT

HIGH-PERFORMANCE COMPUTING



THE BEST GETS BETTER IN 2018

# ENDNOTES

Great Products in High Performance PCs

Ryzen 7 1800X

Threads:

Based on specifications at AMD.com and Intel.com as of January 5, 2018. AMD Ryzen 5 desktop processors have 8 to 12 threads, but Intel Core i5 desktop processors have 4 to 6 threads. AMD Ryzen 7 desktop processors have 16 threads, but Core i7 desktop processors have 8 to 12 threads. RZN-117

Performance:

Based on data obtained from Guru3d.com and PCWorld.com as of on Oct. 5th, 2017 . Results and methodology not independently verified by AMD. See [http://www.guru3d.com/articles\\_pages/intel\\_core\\_i7\\_8700k\\_processor\\_review.html](http://www.guru3d.com/articles_pages/intel_core_i7_8700k_processor_review.html) and <https://www.pcworld.com/article/3230369/components-processors/core-i7-8700k-review-prices-specs-benchmarks.html>. Guru3D.com reported that the Core i7-8700K achieved the following performance: 1402 in Cinebench nt; 424 MB/s in a 7-Zip archive decompress; completed the Corona benchmark in 2.34 seconds; and encoded a Magix Vegas PRO video in 16.07 seconds. Guru3D.com reported that the Ryzen 7 1800X achieved the following performance: 1637 in Cinebench nt, or  $(1637/1402=117\%)$  17% faster than the Core i7-8700K; 516 MB/s in a 7-Zip archive decompress, or  $(516/424=122\%)$  22% faster than the Core i7-8700K; completed the Corona benchmark in 2.18 seconds, or  $(2.34/2.18=107\%)$  7% faster than the Core i7-8700K; and encoded a Magix Vegas PRO video in 15.33 seconds, or  $(16.07/15.33=105\%)$  5% faster than the Core i7-8700K. PCWorld.com reported that the Core i7-8700K achieved the following performance: completed a Handbrake encode in 1484 seconds; and encoded an Adobe Premiere video in 307 seconds; and encoded an Adobe Premiere video in 307 seconds. PCWorld.com reported that the Ryzen 7 1800X achieved the following performance: completed a Handbrake encode in 1484 seconds; and encoded an Adobe Premiere video in 307 seconds; and encoded an Adobe Premiere video in 272 seconds, or  $(307/272=113\%)$  13% faster than the Core i7-8700K. RZN-100

Ryzen 5 2400G

Performance:

Testing by AMD Performance labs as of 12/08/2017 for the Ryzen 5 2400G, and 09/04/2015 for the Core i7-5775c on the following systems. PC manufacturers may vary configurations yielding different results. Results may vary based on driver versions used. System Configs: All systems equipped with Samsung 850 PRO 512GB SSD, Windows 10 RS2 operating system. Socket AM4 System: Ryzen 52400G processor, 16B (2 x 8GB) DDR4-2667 RAM, Graphics Driver 1710181048-17.40-171018a-319170E 23.20.768.0 :: 12/08/2017. Socket LGA1150 System: Core i7-5775c processor, 8GB (2x4GB) DDR3-1867 MHz RAM, graphics driver 10.18.15.4256:: 09/04/2015. 3DMark 11 Performance benchmark used to represent graphics power. The following processors achieved the following scores in 3DMark 11 'performance' benchmark v1.0.132.0: The Ryzen 5 2400G: 5042. Also in v1.0.132.0, .The Core i7-5775c, the Intel desktop processor with the highest Intel desktop graphics performance, achieved 3094. RZG-01

Threads:

Based on specifications at AMD.com and Intel.com as of January 5, 2018. AMD Ryzen 5 desktop processors have 8 to 12 threads, but Intel Core i5 desktop processors have 4 to 6 threads. AMD Ryzen 7 desktop processors have 16 threads, but Core i7 desktop processors have 8 to 12 threads. RZN-117

## ENDNOTES

### Great Products in High Performance Graphics

More Gaming Performance on Radeon RX Vega 64 vs. GTX 1080. Testing done by AMD performance labs Sept 12, 2017 on a test system comprising of an Intel Core i7-7700K (@4.2GHz), 16GB Memory (DDR4-3000MHz), AMD (Vega) driver 17.30-170723n, NVidia driver 384.76 WHQL, and Windows 10 (64-bit). PC manufacturers may vary configurations yielding different results. Tests included 3DMark 11, Ashes of the Singularity (DirectX12 High Preset, 1440p UltraWide), Battlefield 1 (DirectX 12 Ultra settings 1440p UltraWide), Civilization 6 (Ultra settings 1440p Ultrawide), Doom (Vulkan, Ultra Preset, 1440p UltraWide). The Radeon™ RX Vega 64 averaged 22431, 85, 85, 73, 93 fps respectively. The GTX 1080 Founders Edition card averaged 22219, 87, 80, 73, 85 fps. All scores are an average of three test runs. Results may vary based on driver version used. VG-25

### Great Products in the Data Center

AMD EPYC™ 7601 processor supports up to 8 channels of DDR4-2667, versus the Xeon Platinum 8180 processor at 6 channels of DDR4-2667. NAP-42

AMD EPYC 7601 processor includes up to 32 CPU cores versus the Xeon Platinum 8180 processor with 28 CPU cores. NAP-43

AMD EPYC™ processor supports up to 128 PCIe® Gen 3 I/O lanes (in both 1 and 2-socket configuration), versus the Intel® Xeon® SP Series processor supporting a maximum of 48 lanes PCIe® Gen 3 per CPU, plus 20 lanes in the chipset (max of 68 lanes on 1 socket and 116 lanes on 2 socket). NAP-56

# ENDNOTES

## Leadership Mobile Product

Based on testing of the AMD Ryzen™ 5 2500U, and Core i5-8250U mobile processors as of 12/21/2017. Performance based on Cinebench R15 1T and nT, and 3DMark® Time Spy in order of AMD 2500U and Intel 8250U. Cinebench R15 1T results: 139.25, 145.47 giving  $139.25/145.47 = .96X$  or 96% single thread performance; Cinebench R15 nT results: 606.5, 506.62 giving  $606.5/506.62 = 1.20X$  or 120% multi-thread CPU performance or 20% more multithread CPU performance; 3DMark Time Spy results: 865, 386 giving  $865/386 = 2.24X$  or 224% graphics performance or 124% more graphics performance.

AMD Ryzen™ 5 2500U: HP 83C6, AMD Ryzen™ 5 2500U Mobile Processor with Radeon™ Vega 8 Graphics, 8GB Dual Channel (2x4GB) DDR4-2400 RAM, Samsung 850 PRO 512GB SATA SSD, Windows 10 Pro RS2, Graphics driver 22.19.655.0, 12-Sep-2017  
i5-8520U: HP 83C8, i5-8520U with Intel UHD Graphics 620, 8GB Dual Channel (2x4GB) DDR4-2400 RAM, Samsung 850 PRO 512GB SATA SSD, Windows 10 Pro RS2, Graphics driver 22.20.16.4771, 12-Aug-2017. Different configurations and drivers may yield different results. RVM-54

AMD Ryzen™ 5 2500U: HP 83C6, AMD Ryzen™ 5 2500U Mobile Processor with Radeon™ Vega 8 Graphics, 8GB Dual Channel (2x4GB) DDR4-2400 RAM, Samsung 850 PRO 512GB SATA SSD, Windows 10 Pro RS2, Graphics driver 22.19.655.0, 12-Sep-2017  
i5-8520U: HP 83C8, i5-8520U with Intel UHD Graphics 620, 8GB Dual Channel (2x4GB) DDR4-2400 RAM, Samsung 850 PRO 512GB SATA SSD, Windows 10 Pro RS2, Graphics driver 22.20.16.4771, 12-Aug-2017

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“Zen”, “Vega” and “Navi” are codenames for AMD architectures and are not product names.

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