



**Knowledge
sharing**

AMD MEET THE EXPERTS 

SEPTEMBER 2016

Zen – The Journey So Far

Suggested AMD Budget Builds

Q&A



CAROLINA CASTAÑO
Channel Enablement Manager



JAMES PRIOR
Channel Business
Development Manager



DON WOLIGROSKI
Product Marketing
Manager



JAMES PRIOR 

CHANNEL BUSINESS
DEVELOPMENT MANAGER



AMD

ZEN

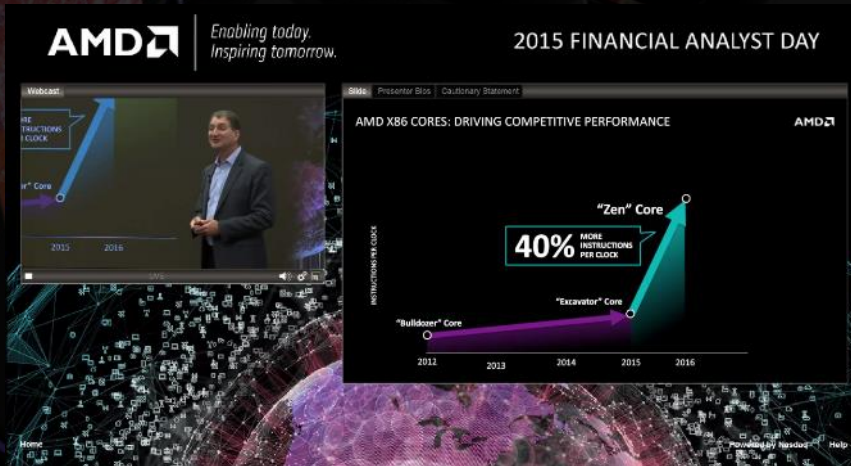
The Journey So Far

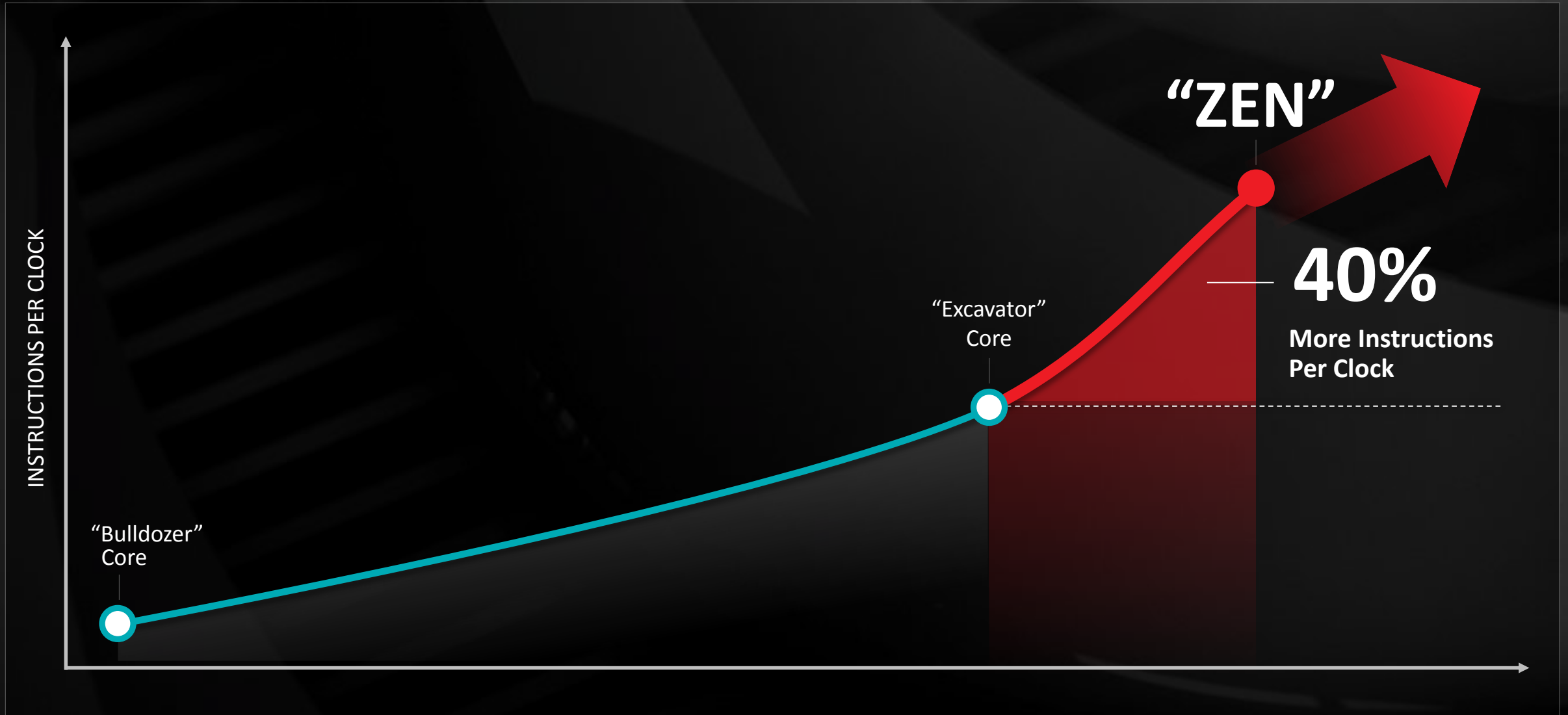
FIRST INTRODUCTION TO “ZEN” AT FINANCIAL ANALYST DAY 2015



“ZEN”

- Totally New High-performance Core Design
- Simultaneous Multithreading (SMT) for High Throughput
- New High-Bandwidth, Low Latency Cache System
- Energy-efficient FinFET Design Scales from Client to Enterprise-class Products





AMD Desktop Platform Evolution



"That sound you just heard was a million AMD enthusiasts breathing a sigh of relief" – [PCWorld](#)¹

"there is a sense of change at AMD – not just the products, but the way it handles the little things." – [TechGage](#)²

"AMD's ...sending a message along with the information: 'We hear you.'" – [PCWorld](#)¹



“SUMMIT RIDGE”

“Zen” Delivers
40% More IPC

8 Cores and
16 Threads

All New AM4 Desktop Platform





- Core-to-Core, Thread-to-Thread, Clock-to-Clock comparison to Intel “Broadwell-E” i7-6900K at same clock speeds as Zen engineering sample
- 3D scene rendering demo using Blender, open source application
- Time to completion workload demonstrates progress and feature enablement



ZEN PERFORMANCE & POWER IMPROVEMENTS			AMD
BETTER CORE ENGINE	BETTER CACHE SYSTEM	LOWER POWER	
<ul style="list-style-type: none">- Two threads per core- Branch mispredict improved- Better branch prediction with 2 branches per BTB entry- Large Op Cache- Wider micro-op dispatch 6 vs. 4- Larger Instruction Schedulers Integer: 84 vs. 48 FP: 96 vs. 60- Larger retire 8 ops vs. 4 ops- Quad issue FPU- Larger Retire Queue 192 vs. 128- Larger Load Queue 72 vs. 44- Larger Store Queue 44 vs. 32	<ul style="list-style-type: none">- Write back L1 cache- Faster L2 cache- Faster L3 cache- Faster Load to FPU: 7 vs. 9 cycles- Better L1 and L2 data prefetcher- Close to 2x the L1 and L2 bandwidth- Total L3 bandwidth up 5x	<ul style="list-style-type: none">- Aggressive clock gating with multi-level regions- Write back L1 cache- Large Op Cache- Stack Engine- Move elimination- Power focus from project inception- Low Power Design Methodologies	
40% IPC PERFORMANCE UPLIFT			

*See Endnotes for details

- Mike Clark, Senior Fellow & lead architect deep dive on “ZEN” CPU core
- Hash Perceptron Branch Prediction neural network inside every Zen-based processor
- Large, fast, cache and memory subsystem supporting DDR4
- Increasing performance and reducing power at the same time

- *“The demonstration exceeded the crowd’s expectations. ‘This is the most exciting AMD (CPU) launch in a decade,’ said Kevin Krewell, principal analyst with Tirias Research, who attended the event. ‘They really have hit the mark on this.’”* – **Gordon Mah Ung, [PC World](#)³**
- *“Power users and enthusiasts who have been hoping for years that processor maker AMD would once again find a way to take on Intel may soon see their wish granted.”* – **Matthew Murray, [PC Magazine](#)⁴**
- *“We have asked for, and needed, as an industry, a competitor to Intel in the enthusiast CPU space – something we haven’t legitimately had since the Athlon X2 days. Zen is what we have been pining over, what gamers and consumers have needed.”* – **Ryan Shrout, [PC Perspective](#)⁵**

SUMMIT RIDGE CPU

“ZEN”

New High-Performance
Core Designed from the
Ground Up

Volume availability
expected in Q1

Aimed at Enthusiast
desktop segment

Flexible AM4 platform supports DDR4 and PCIe
Gen 3 with both “Summit Ridge” and 7th Gen
“Bristol Ridge” processors sharing the socket



THE PATH TO

ZEN



DON WOLIGROSKI 

PRODUCT MARKETING MANAGER

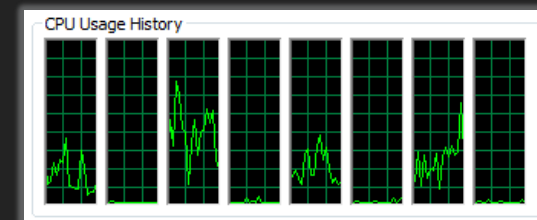
THE MULTI-THREADED FUTURE OF THE DESKTOP MARKET

AS MOORE'S LAW IS CHALLENGED, PARALLELISM TAKES OVER



Game Engines

The most popular AAA titles of 2016 list a quad-threaded processor as a *minimum* requirement



Multi-Tasking and the User Interface

Now a critical part of the PC experience as users become more technically savvy

Content Creation

Media creation software like image processing and 3D Rendering continues to push the limits of multiple cores



New, Low-Level Graphics APIs

(i.e. DirectX® 12 Multi-Core Scaling, Vulkan)

DirectX 12

Virtual Reality

Multi-threading processors are required to drive smooth VR experiences



COMPETITIVE PRODUCT POSITIONING

THE PERFORMANCE YOU NEED — AMD FX™ 8300 AND 6300 PROCESSORS OFFER THE HIGHEST CLOCKS & MOST CORES IN THEIR CLASS⁷

THE CONTROL YOU WANT — UNLOCKED MULTIPLIER FOR CONFIGURABLE POWER AND PERFORMANCE⁵

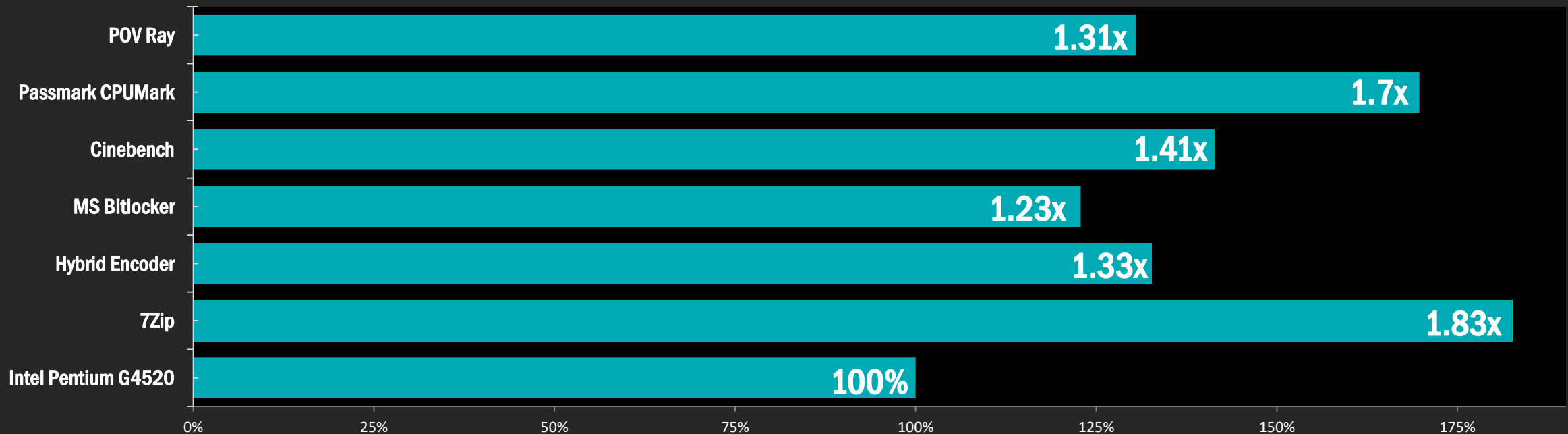
PROVEN RELIABILITY YOU DESERVE — FROM THE MANUFACTURER OF PROCESSORS CHOSEN BY HP, MICROSOFT, SAMSUNG, AND SONY

	AMD FX™ 8300	Intel Core i3 6100	AMD FX™ 6300	Intel Pentium G4520
# of CPU Cores	8	2	6	2
# of Threads	8	4	6	2
Max/Base Freq (GHz)	4.2/3.3	3.7	4.1/3.5	3.6
L2 Cache (MB)	8	0.5	6	0.5
Total Cache (L2+L3, in MB)	16	4.5	14	3.5
Multiplier Unlocked? ¹³	Yes	No	Yes	No
Cooler	Stock	Stock	Stock	Stock
E-tail Price*	\$119.99	\$124.73	\$89.99	\$90.32

AMD FX™ 6300 COMPETITIVE PERFORMANCE

VS. INTEL PENTIUM G4520, NORMALIZED TO THE COMPETITION

AMD FX™ 6300 vs Intel Pentium G4520

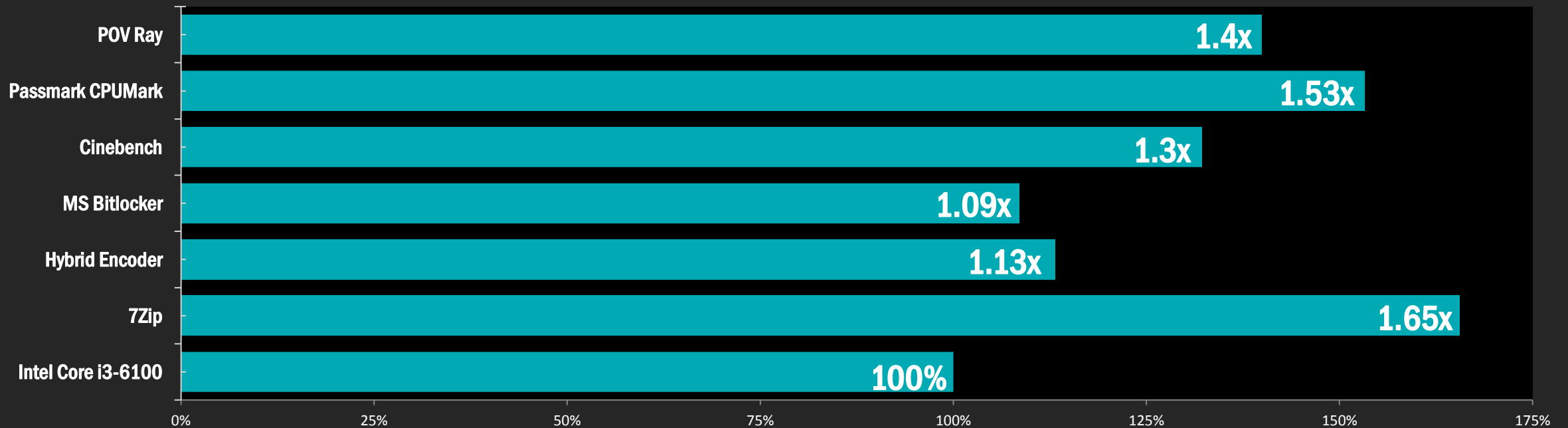


With 3x the cores and thread count, AMD's FX™ 6300 can significantly beat the Intel Pentium G4520 in multi-threaded testing^{6,7}

AMD FX™ 8300 COMPETITIVE PERFORMANCE

VS. INTEL CORE I3-6100, NORMALIZED TO THE COMPETITION

AMD FX™ 8300 vs Intel Core i3-6100



With 4x the cores and double the thread count, AMD's FX™ 8300 can significantly beat the Intel Core i3-6100 in multi-threaded testing^{8,9}

AND, OF COURSE, FX™ CAN GAME, TOO!

SMOOTH PERFORMANCE IN POPULAR TITLES AND VR

AMD PARTNER
TRAINING
MEET THE EXPERTS



SMOOTH GAMEPLAY

When paired with a modest Radeon RX 460 card, the FX™ 8300 and 6300 achieved smooth average frame rates above 60 FPS in Overwatch, DOTA2, Counter Strike: Global Offensive, and League of Legends at 1080p. ¹⁰



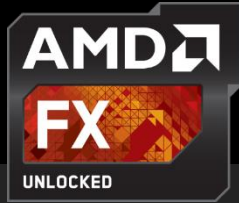
FREE Deus Ex: Mankind Divided™ game code when you purchase an AMD 6- or 8-core FX™ processor!*

Virtual Reality-Capable

Armed with a Radeon RX 480 graphics card, the FX™ 8300 processor powered AMD's VR-demo PC at the PAX 2016 Gaming show with great results



SUGGESTED AMD FX BUILD CONFIGURATIONS



Experience	Best		Better				Good	
Product	FX 9590	FX 9370	FX 8370	FX 8350	FX 8320	FX 6350	FX 8300	FX 6300
CPU Cores	8	8	8	8	8	8	6	6
CPU Frequency (Turbo/Base)	5.0 / 4.7 GHz	4.7 / 4.4 GHz	4.3 / 4.0 GHz	4.2 / 4.0 GHz	4.0 / 3.5 GHz	4.2 / 3.9 GHz	4.2 / 3.3 GHz	4.1 / 3.5 GHz
AMD Motherboard Chipset	990FX	990FX	970	970	970	970	970	970
Memory	2 x 8GB DDR3-2133	2 x 8GB DDR3-2133	2 x 8GB DDR3-1866	2 x 8GB DDR3-1866	2 x 8GB DDR3-1866	2 x 8GB DDR3-1866	2 x 8GB DDR3-1866	2 x 8GB DDR3-1866
GPU	R9 Fury	R9 390X	RX 480	RX 480	RX 470	RX 470	RX 460	RX 460
Newegg Build Retail Price							\$440*	\$410*



Q&A

IF YOUR QUESTION WAS NOT ANSWERED
IN TODAY'S SESSION, PLEASE CONTACT US AT

AMDPARTNER.PROGRAM@AMD.COM

THANK YOU!

Visit the [AMD Partner Hub](#) for the latest sales tools, trainings and marketing materials

The screenshot displays the AMD Partner Hub website. At the top left is the AMD logo with the tagline "Enabling today. Inspiring tomorrow." To the right is the "PARTNER HUB" title and a search bar labeled "SEARCH PARTNER HUB". Below this is a navigation bar with links: "MARKETING MATERIALS", "TRAINING", "CONNECT", "RESOURCES", "AMD ENABLED PLATFORMS", "SUPPORT", and a globe icon. The main content area features three large cards: "Sales Tools & Assets" (with a download icon), "Training" (with a play icon), and "Meet the Experts" (with a lightbulb icon). To the right of these cards are two smaller sections: "Channel News" with a "SIGN UP" button and "Authorized Distributors" with a "MORE INFORMATION" button.

AMD | Enabling today. Inspiring tomorrow.

PARTNER HUB

SEARCH PARTNER HUB

MARKETING MATERIALS | TRAINING | CONNECT | RESOURCES | AMD ENABLED PLATFORMS | SUPPORT

Sales Tools & Assets

Download the marketing assets you need to help you sell and market AMD.

Training

Learn about the latest AMD products and technologies.

Meet the Experts

Hear from AMD product and marketing professionals to learn about AMD products, technologies, and industry insights.

Channel News

Keep up to date by signing up for the AMD Channel newsletter.

SIGN UP

Authorized Distributors

Check out the list of AMD Authorized Distributors.

MORE INFORMATION

Slide 6, 8 & 10:

Based on internal AMD estimates for “Zen” x86 CPU core compared to “Excavator” x86 CPU core.

Slide 7:

1. Taken on September 26, 2016 from: <http://www.pcworld.com/article/3020184/computers/amd-zen-based-cpus-and-apus-will-unify-around-socket-am4.html>
2. Taken on September 26, 2016 from: <http://techgage.com/news/amd-ces-2016-socket-consolidation-quieter-coolers-faster-apus/>

Slide 11:

3. Taken on September 26, 2016 from: <http://www.pcworld.com/article/3109327/hardware/let-the-cpu-wars-begin-amd-shows-its-zen-cpu-can-compete-with-intels-best.html>
4. Taken on September 26, 2016 from: <http://www.pcmag.com/news/347116/amd-unveils-zen-microarchitecture-details>.
5. Taken on September 26, 2016 from: <http://www.pcper.com/reviews/Processors/AMD-Zen-Architecture-and-Performance-Preview>

Slide 17:

6. AMD FX™ 6300 CPU (\$90) has 6 CPU cores (6 threads) vs the Intel Pentium G4520 CPU (\$90) with 2 CPU cores (2 threads); Prices taken from Newegg.com 13/09/2016. See amd.com and ark.intel.com for product specifications. DTV-80
7. All performance tests by internal AMD benchmark labs. The AMD FX 6300 scored 419.52 in Cinebench R15; 6650.93 in PassMark CPU; 983.67 in POV Ray; Completed the 7-zip test in 40.81 seconds; completed the Hybrid Encoder workload in 45.28 seconds; and completed the MS Bitlocker encryption in 37.92 seconds. The Intel Pentium G4520 scored 296.75 in Cinebench R15; 3918.3 in PassMark CPU; 753.75 in POV Ray; Completed the 7-zip test in 74.55 seconds; completed the Hybrid Encoder workload in 60.07 seconds; and completed the MS Bitlocker encryption in 46.58 seconds. DTV-82

Slide 18:

8. AMD FX™ 8300 CPU (\$120) has 8 CPU cores (8 threads) vs the Intel Core i3-6100 CPU (\$125) with 2 CPU cores (4 threads with hyperthreading); Prices taken from Newegg.com 13/09/2016. See amd.com and ark.intel.com for product specifications. DTV-79
9. All performance tests by internal AMD benchmark labs. The AMD FX 8300 scored 528.72 in Cinebench R15; 7999.48 in PassMark CPU; 1235.23 in POV Ray; Completed the 7-zip test in 32.58 seconds; completed the Hybrid Encoder workload in 36.97 seconds; and completed the MS Bitlocker encryption in 37.45 seconds. The Intel Core i3-6100 scored 399.95 in Cinebench R15; 5218.63 in PassMark CPU; 882.64 in POV Ray; Completed the 7-zip test in 53.95 seconds; completed the Hybrid Encoder workload in 41.84 seconds; and completed the MS Bitlocker encryption in 40.66 seconds. DTV-81

Slide 19:

10. All performance tests by internal AMD benchmark labs. Tests captured at 1080p resolution, with average frame rates during the benchmark run. The AMD FX 6300 achieved 215 FPS in Counter Strike: Global Offensive, 116 FPS in League of Legends, 85.4FPS in DOTA2, and 110.7 FPS in Overwatch. The AMD FX 8300 achieved 219.03 FPS in Counter Strike: Global Offensive, 121.11 FPS in League of Legends, 88.25 FPS in DOTA2, and 101.8 FPS in Overwatch. DTV-83

Slide 20:

System prices include Cougar Spike Steel case: \$27, Corsair CX450M PSU: \$50, 128GB Sandisk Z400s SSD: \$45, Radeon RX 460: \$110, 2x8gb DDR3 1866 Ballistix Sport 8GB: \$33, Gigabyte 970A-DS3P board: \$55, with either an AMD FX 8300: \$120 or an AMD FX 6300: \$90. Prices as displayed on Newegg.com on September 15, 2016.

DISCLAIMER AND ATTRIBUTION



THE INFORMATION PRESENTED IN THIS DOCUMENT IS FOR INFORMATIONAL PURPOSES ONLY AND MAY CONTAIN TECHNICAL INACCURACIES, OMISSIONS AND TYPOGRAPHICAL ERRORS.

THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE AND MAY BE RENDERED INACCURATE FOR MANY REASONS, INCLUDING BUT NOT LIMITED TO PRODUCT AND ROADMAP CHANGES, COMPONENT AND MOTHERBOARD VERSION CHANGES, NEW MODEL AND/OR PRODUCT RELEASES, PRODUCT DIFFERENCES BETWEEN DIFFERING MANUFACTURERS, SOFTWARE CHANGES, BIOS FLASHES, FIRMWARE UPGRADES, OR THE LIKE. AMD ASSUMES NO OBLIGATION TO UPDATE OR OTHERWISE CORRECT OR REVISE THIS INFORMATION. HOWEVER, AMD RESERVES THE RIGHT TO REVISE THIS INFORMATION AND TO MAKE CHANGES FROM TIME TO TIME TO THE CONTENT HEREOF WITHOUT OBLIGATION OF AMD TO NOTIFY ANY PERSON OF SUCH REVISIONS OR CHANGES.

AMD MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE CONTENTS HEREOF AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES, ERRORS OR OMISSIONS THAT MAY APPEAR IN THIS INFORMATION.

AMD SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT WILL AMD BE LIABLE TO ANY PERSON FOR ANY DIRECT, INDIRECT, SPECIAL OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF ANY INFORMATION CONTAINED HEREIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

ATTRIBUTION

© 2016 ADVANCED MICRO DEVICES, INC. ALL RIGHTS RESERVED. AMD, THE AMD ARROW LOGO, RADEON, FX, AND COMBINATIONS THEREOF ARE TRADEMARKS OF ADVANCED MICRO DEVICES, INC. IN THE UNITED STATES AND/OR OTHER JURISDICTIONS. OTHER NAMES ARE FOR INFORMATIONAL PURPOSES ONLY AND MAY BE TRADEMARKS OF THEIR RESPECTIVE OWNERS.

STAR WARS © AND TM 2015 LUCASFILM LTD. ALL RIGHTS RESERVED. UNDERLYING TECHNOLOGY AND GAME DESIGN © EA. ALL RIGHTS RESERVED.

