



THE PATH TO
ZEN

日本AMD エンタープライズセールス 岩佐英敏


PCクラスタコンソーシアム向け
December 15TH, 2016

OUR TWO-YEAR JOURNEY

“First and foremost, we are here to build great products through our investments in differentiated IP coupled with our design, integration, software and system capabilities.”


OCTOBER 2014

OUR FOCUS




GAMING

\$15B+



**IMMERSIVE
PLATFORMS**

\$20B+



DATACENTER

\$18B+



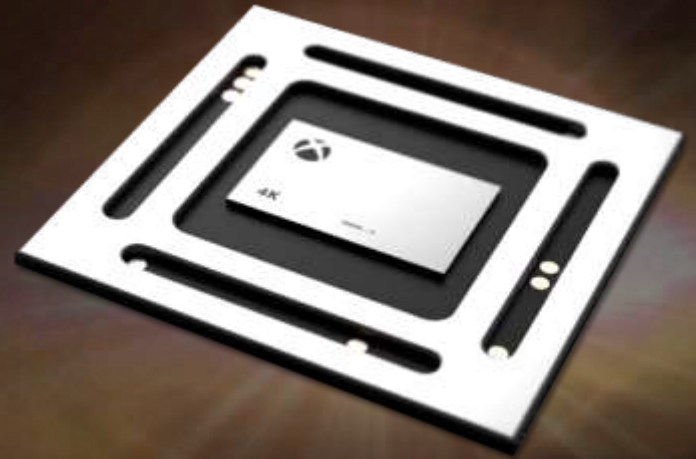
XBOX ONE S

SMALLEST XBOX
EVER
4K VIDEO AND HDR

AMD

XBOX PROJECT SCORPIO

4K GAMING
AND VR



AMD

PLAYSTATION 4

43 MILLION
VR-READY
CONSOLES





APPLE

iMAC AND
MACBOOK PRO
WITH RETINA
DISPLAYS

R A D E O N **R X** **4** **8** **0**

**INDUSTRY FIRST
PREMIUM VR
STARTING AT \$199**



AMD

RADEON PRO

INCREDIBLE PERFORMANCE
AND FEATURES FOR
PROFESSIONAL
PLATFORMS



PRO SSG





7TH GENERATION A-SERIES APU

THREE STRAIGHT QUARTERS OF
MOBILE APU GROWTH

RECORD ENTERPRISE SALES
IN Q2 2016

Enterprise sales statement: Record sales of AMD mobile APU-based commercial systems to major corporate buyers by OEMs.





TF · AMD

INNOVATIVE PARTNERSHIPS

THATIC JV TO DEVELOP SERVER
SOCs FOR 2ND LARGEST SERVER
MARKET

ATMP JV WITH TFME CREATES
INDUSTRY-LEADING OSAT

BEST IS YET
TO
COME

MOST COMPETITIVE PRODUCT LINEUP IN A
DECADE



OUR X86 HERITAGE

First to break
1GHz



First x86 64-bit
architecture



First x86
dual-core processor



First APU to
market



First quad-
core x86 SoC



Fastest CPU
in market



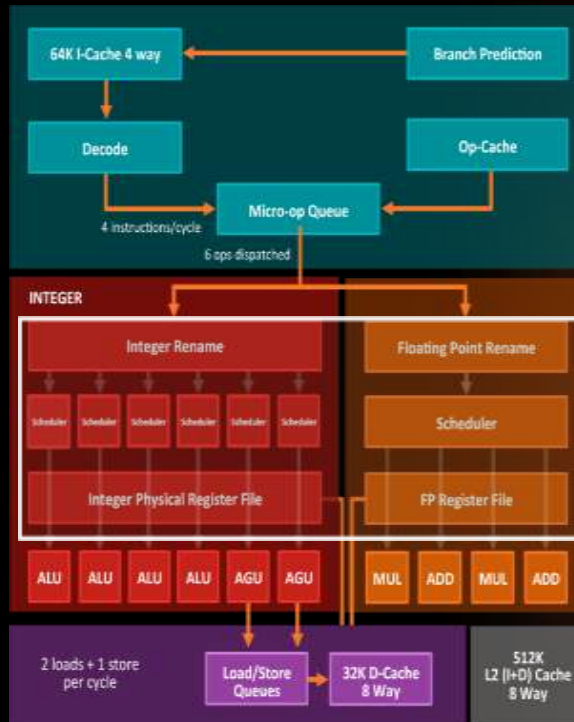
First x86
game console



DESIGNING THE “ZEN” ENGINE

- 1 | PERFORMANCE
- 2 | THROUGHPUT
- 3 | EFFICIENCY

DESIGNING THE ENGINE: PERFORMANCE



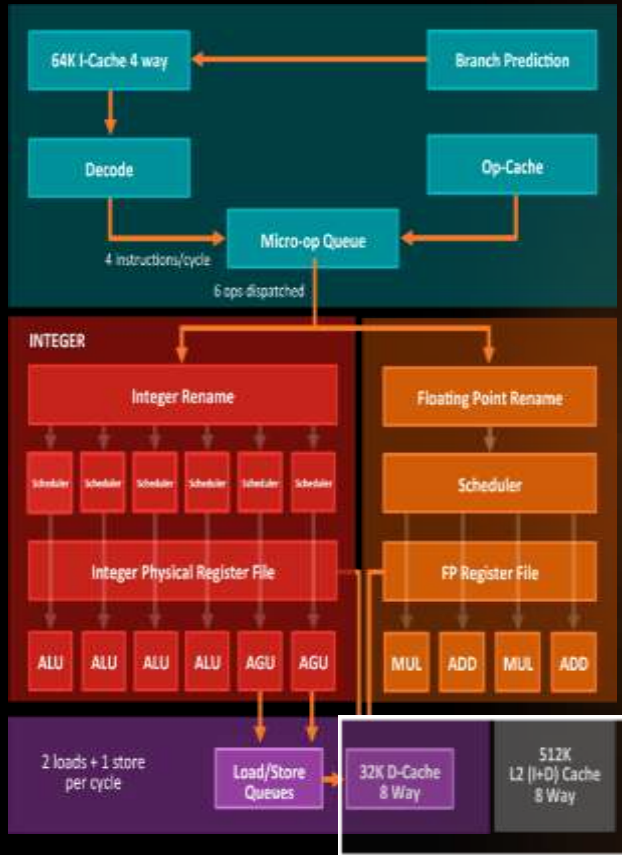
QUANTUM LEAP IN CORE EXECUTION CAPABILITY

- Enhanced branch prediction to select the right instructions
- Micro-op cache for efficient op issue
- 1.75X instruction scheduler window*
- 1.5X issue width and execution resources*
- Result: instruction level parallelism designed for dramatic gains in single-threaded performance

*Compared to Excavator



DESIGNING THE ENGINE: THROUGHPUT

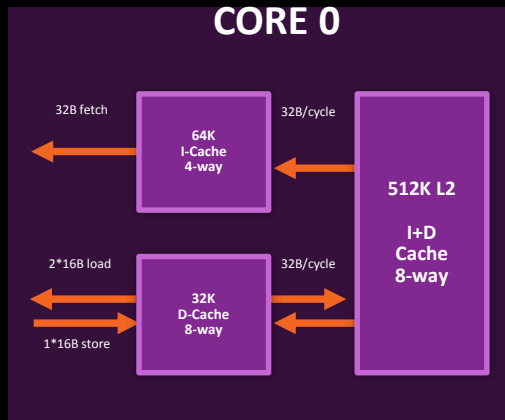


HIGH BANDWIDTH,
LOW LATENCY

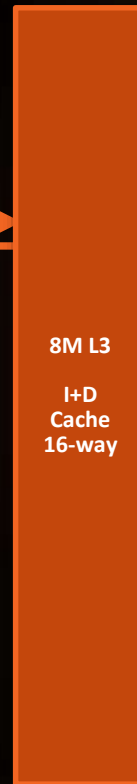
- ▲ Significantly enhanced pre-fetcher
- ▲ 8MB of shared L3 cache
- ▲ Large unified L2 cache for instructions and data
- ▲ Separate low latency L1 instruction and L1 Data caches
- ▲ Up to 5X cache bandwidth to a core



DESIGNING THE ENGINE: THROUGHPUT



HIGH BANDWIDTH,
LOW LATENCY



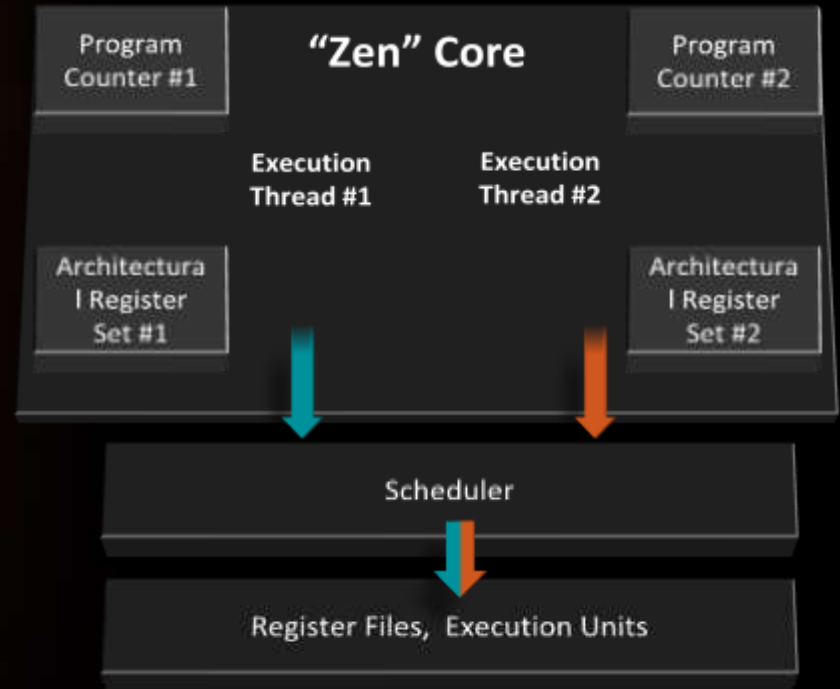
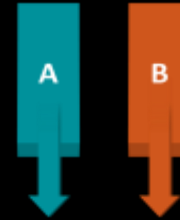
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DESIGNING THE ENGINE: THROUGHPUT

SIMULTANEOUS MULTI-THREADING

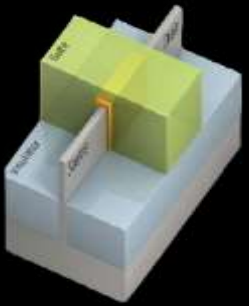
- Thread appears the same as an independent core to software
- High performance cores have gaps in utilization now exploited for an additional thread
- Excellent synergy with single thread – more execution resources benefit both modes

Program Threads



DESIGNING THE ENGINE: EFFICIENCY

IMPROVED TRANSISTOR DENSITY & EFFICIENCY



▲ Energy-efficient 14nm FinFET design scales from client to enterprise-class products



FinFET PROCESS BENEFIT

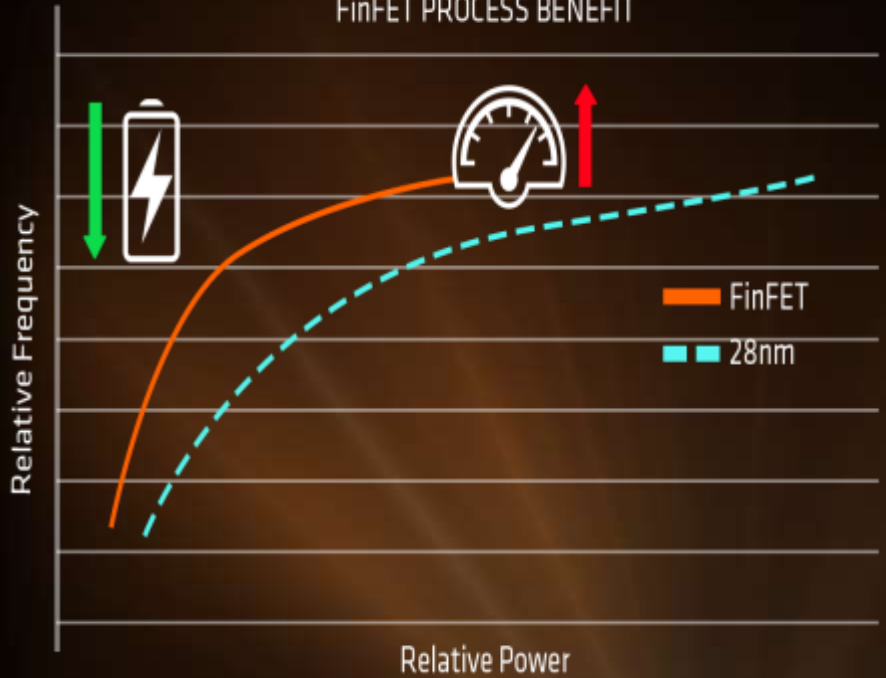
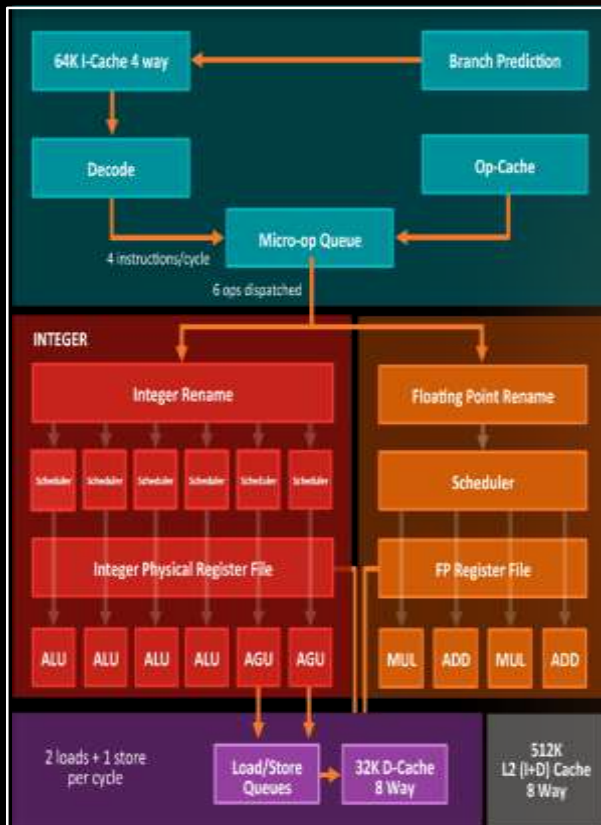


Chart for illustrative purposes

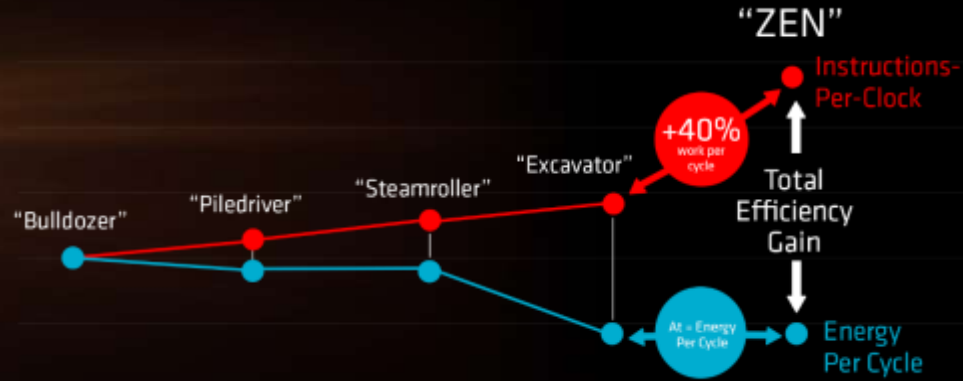
DESIGNING THE ENGINE: EFFICIENCY



LOW-POWER DESIGN METHODOLOGIES

- ▲ Aggressive clock gating with multi-level regions
- ▲ Write back L1 cache
- ▲ Large Micro-op cache
- ▲ Stack Engine
- ▲ Move elimination

DEFYING CONVENTION: PERFORMANCE, THROUGHPUT AND EFFICIENCY



*Based on AMD Internal Testing

Chart for illustrative purposes only

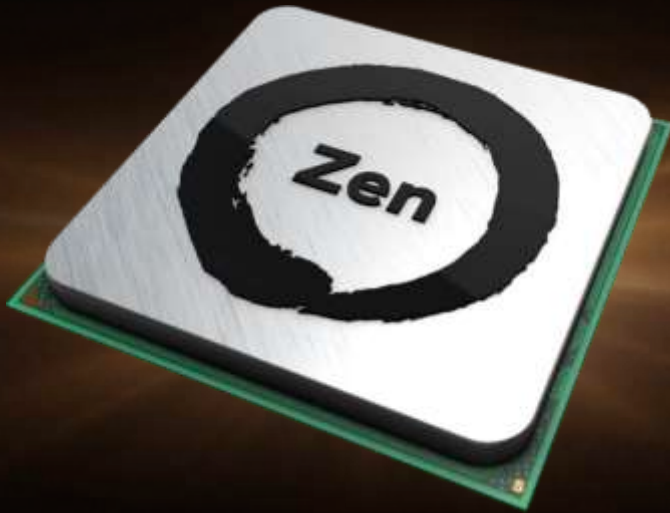


WE ARE BACK, AND JUST GETTING STARTED!



*Based on AMD Internal Testing





“SUMMIT RIDGE”

8 CORES, 16

THREADS

AM4 Platform

- DDR4
 - PCI EXPRESS® GEN 3
 - NEXT-GEN I/O
-

AMD consortium activity

EFFORT TO BRING OPEN STANDARDS INTO THE DATACENTER

- これまでのOpen Standardへの参画
 - ▪ HSA (Heterogeneous System Architecture)
 - 異なるアーキテクチャのデバイス間のプログラミングモデルを提唱
 - ▪ GPUOpen
 - Open Standard platformにAMDが寄与したツールやソフトウェアを一か所でアクセスできるサイト
- 2016年に発表したコンソーシアム
 - ▪ Gen-Z
 - メモリーやアクセラレータへのラックスケールの接続
 - ▪ OpenCAPI
 - データセンターサーバ向けのオープンなインターフェース規格
 - ▪ CCIX
 - 複数のプロセッサアーキテクチャとアクセラレータ間のシームレスなデータ共有を狙う接続技術

“NAPLES” SERVER SOC



*32-Core,
64-Thread*



*1st Public
Demo*



*Enabling Industry
Software Support*

ZEN DEMOS TODAY



VR Desktop



2P Server

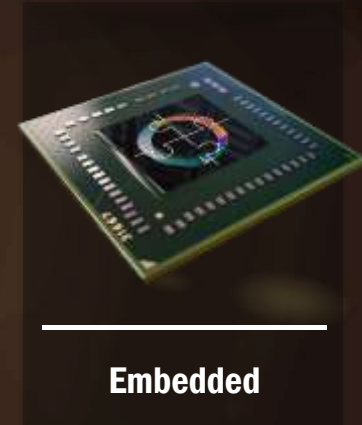
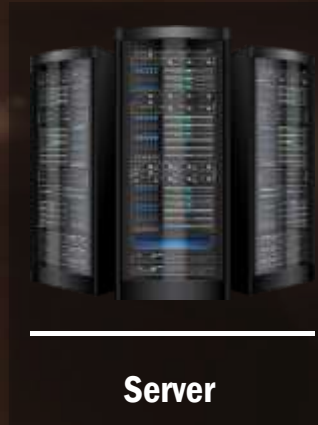


Workstation



Gaming Desktop

ZEN CORE MARKET ROLLOUT



THE LAST 12 MONTHS

Released Game-Changing Polaris
GPU Architecture and 7th Gen APUs
Ramped Game Consoles and
New Semi-Custom Business
Announced Two New JVs in China

THE NEXT 12 MONTHS

GPU Market Share Gains with
Polaris and New Vega Architecture
Return to Growth In PCs with “Zen”
Re-Enter Highly-Profitable x86
Server Market with “Naples”
Ramp New Semi-Custom Business



BEST IS YET
TO COME

AMD 

ご静聴ありがとうございました。

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