**AMD 2013-2014 SERVER ROADMAP**

### 2P and 4P Enterprise, Mainstream Platforms
- **2013**
  - **AMD Opteron™ 6300 and 4300 Series**
    - 4, 6, 8, 12 or 16 “Piledriver” CPU Cores
    - 35W-140W
  - **AMD Opteron™ 3300 Series**
    - 4 or 8 “Piledriver” CPU Cores
    - 25W-65W TDP

### 1P Web/Enterprise Services Clusters
- **2013**
  - **AMD Opteron™ X1150 CPU and X2150 APU**
    - 4 “Jaguar” CPU Cores
    - GCN Graphics Compute Units (APU)
    - 9W-22W
  - **AMD Opteron™ 3300 Series**
    - 4 or 8 “Piledriver” CPU Cores
    - 25W-65W TDP

### 2014
- **“Warsaw” CPU**
  - 12 or 16 “Piledriver” CPU Cores
- **“Berlin” CPU/APU**
  - 4 “Steamroller” CPU Cores
  - GCN Graphics Compute Units (APU)
  - HSA Features (APU)
- **“Seattle” CPU**
  - ARM “A57” CPU Cores
APU PROVIDES GREAT ENERGY EFFICIENCY INTEGRATION

▲ Combines CPUs and GPU onto a single die

▲ APU energy performance optimization
  • Efficient, fine-grained power management between CPU and GPU
  • CPU<->GPU communication power dramatically reduced relative to separate chips
  • Shared memory interface helps save power
NOT ONLY HARDWARE, BUT SOFTWARE TOO

- HSA is a new standard that allows different compute elements to be mixed together on the same piece of silicon
  - Example: CPU, GPU and DSP

- Energy efficient – running parallel code on the GPU
  - CPU and GPU share main memory eliminating processor cycles to move between the two
  - Reduced instructions path also minimizes cycles

- HSA enables work to be routed to best resource
  - Some cores optimized for:
    - High Throughput
    - Low latency
    - Low Power
    - Special Accelerators

- Net effect: reduces cycles and power consumption
Optimized compute density
- Radical performance improvement for HPC, big data, and multimedia workloads
- Low power to maximize performance per watt

Simplified programming
- Single, standard computing environments
- Support for mainstream languages—C, C++, Fortran, Java, .NET
- Lower development costs

What is HSA?

Joins CPUs, GPUs, and accelerators into a unified computing framework
- Single address space accessible to avoid the overhead of data copying
- Use-space queuing to minimize communication overhead
- Pre-emptive context switching for better quality of service

HSA Accelerated Applications
Access to Broad Set of Programming Languages

Legacy Applications

HSA Runtime Infrastructure

OS

Memory

CPU

GPU

ACC

HSA Platform
**FUTURE ENERGY EFFICIENCY GAINS**

- Continued innovation in power management, integration, IP efficiency will reduce average energy use
- Accelerated CPU performance gains coupled with HSA enabled GPU compute will drive overall APU performance
- Fewer battery charges, less infrastructure material (i.e. thinner and lighter)

---

1. Typical-use Energy Efficiency as defined by taking the ratio of compute capability as measured by common performance measures such as SpecIntRate, PassMark and PCMark, divided by typical energy use as defined by $E_{TSEC}$ (Typical Energy Consumption for notebook computers) as specified in Energy Star Program Requirements Rev 6.0 10/2013
Slide Sources

- “AMD Product and Tech Roadmaps 5.5.14”
- “Energy Efficiency Messaging” May 9, 2014
- “AMD Server Roadmap”, November 2013
DISCLAIMER & 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 OMISSEIONS 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 HERIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

ATTRIBUTION

© 2014 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo and combinations thereof are trademarks of Advanced Micro Devices, Inc. in the United States and/or other jurisdictions. Names are for informational purposes only and may be trademarks of their respective owners.