
# Applied Micro Circuits Corporation

## ARM-based Scale-out Servers

OCP-J Meet up Event June 23, 2016

# Applied Micro at the OCP – Jan 16 2013

## AppliedMicro Contributes First ARM-Based Microserver Specification to Open Compute Project

World's First ARM® 64-bit Server Board Based on New Specification Debuts at Open Compute Summit

MARKETWIRE **Press Release**: AppliedMicro – Wed, Jan 16, 2013 1:00 PM EST

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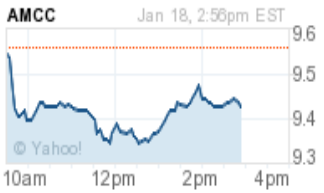
| AMCC | 9.44 | -0.12 |




SANTA CLARA, CA--(Marketwire - Jan 16, 2013) - Open Compute Summit - Applied Micro Circuits Corporation ( NASDAQ : AMCC ) today announced that it has signed its contribution license with the Open Compute Project (OCP) Foundation, developing the first micro server board design specification based on the ARMv8 architecture. The design will leverage the AppliedMicro® X-Gene™ platform, the industry's first ARM 64-bit Server on a Chip™ solution.

As the first ARMv8 contribution to the OCP Motherboard Working Group, the new specification contributed by AppliedMicro will be the foundation for purpose-built cloud and enterprise server deployments specifically focusing on increased density and field serviceability resulting in a lower total cost of ownership (TCO).

"The X-Gene platform is designed to deliver unprecedented low power, high performance and integration, with the goal of changing the way servers are designed for cloud and enterprise applications," said Dr. Paramesh Gopi, president and CEO of AppliedMicro. "This purpose-built server on a chip and open source software deliver the cost efficiency, power and performance needed to serve evolving data center workloads. And, with X-Gene silicon slated to sample to key customers this quarter, an ARM 64-bit server motherboard design has the potential to reach the data center by the end of this year."


# Unique Complement of Products Leverages World-class Engineering Capability, Extensive IP Portfolio, and Top Tier Customer Base

| Segment | Module Name | Module Description | Sample Customers / System Partners |
|---|---|---|---|
| Compute | **X-Gene1** | ▪ X-Gene based X-C1 Server Development Platform | • Tier 1 Global Internet Company<br>• Tier 1 e-Commerce Company<br>• Tier 1 Enterprise Software Company<br>• Tier 1 Global IT Company<br>• Tier 1 Cloud Computing Company<br>• Tier 1 Semiconductor Company<br>• Tier 1 Computer Technology Company<br>• Tier 1 China Internet Company<br>• Tier 1 Operating System Company |
| | **X-Gene2** | ▪ X-Gene 2: 28nm of X-Gene that includes RDMA on-chip | |
| | **X-Gene3** | ▪ X-Gene 3: to be fabricated using advanced FinFET process technology; samples 2H'2016 | |
| Embedded | **HeliX1** | ▪ Embedded processors handle system maintenance and remote management functionality<br>▪ Network, Security, Memory Acceleration Card | • Tier 1 Enterprise Storage Company<br>• Tier 1 Telecommunications Company<br>• Tier 1 Surveillance Appliance Company |
| | **HeliX2** | ▪ HeliX2: industry's first fanless high-performance 28nm embedded ARM 64-bit SoC<br>▪ COM Express Module with 10G NIC | |
| Connectivity | **Service Provider Connectivity Solutions** | ▪ High-density, low-power 10 / 100/ 400G optical transport network (OTN) framer/PHY SoCs designed for service providers and data center networks<br>▪ High performance analog / mixed-signal PHY devices for 10 / 40 / 100 / 400G modules | Alcatel·Lucent, FUJITSU, CISCO, ciena, HUAWEI, JUNIPER NETWORKS, NEC, ARISTA |
| | **Data Center Connectivity Solutions** | ▪ Supports 100 / 400 Gbps of connectivity with multi-protocol features and high density<br>▪ Targets needs of high-bandwidth applications in public cloud, private cloud and enterprise data centers | |

# ARM Platforms Powered by X-Gene

wistron · GIGABYTE · MiTAC · kontron · Cirrascale · E4 COMPUTER ENGINEERING · EuroTech · China unicom 中国联通 · Hewlett Packard Enterprise · uniserver

## Data Center

HP ProLiant m400

Tier 1 China Hyperscale end users

Gigabyte R120-P30 & MP30

ODM Platofrms

## Storage

Wistron X5 OCP Platform

Tier 1 Server Storage Platforms

## Networking

Tier1 Datacenter Switch Platforms

Kontron SYMCLOUD T4010

## High-Performance Computing

E4 ARKA RK003

Cirrascale RM2916

NVIDIA



Eurotech Aurora "Hive"

# X-Gene Software Ecosystem


Operating Systems


Hypervisors & Java


BIOS & Tools

# Wistron X5 OCP Multi-Server

## Platform Features

- Flexible SKUs to support different application
- Easy swap in Computing or Storage based on customer requests
- Front 10G (Storage) or 40G/100G(Computing) Networking access
- 3 +1 Redundant PSU design
- Front to back cooling

## Configuration Features

| | |
|---|---|
| **Processor Support** | Up to 160 ARM cores per 5U:<br>Up to 20 x AppliedMicro X-Gene 1 with 8 cores @ 2.4GHz ARMv8 64-bit cores (8) |
| **I/O** | Networking:<br>• 10GbE for each Node for a total of 170Gbps<br>• Up to 25GbE to each Nodes<br>Memory:<br>• Up to 640GB DDR3 memory<br>Storage:<br>• Up to 400TB of 3.5” HDD<br>• Up to 25.6TB of 2.5” SSD |
| **Chassis** | 5U x W435 x D800 mm<br>Hot swap fans<br>Front to back cooling |
| **Power** | N+1 redundant up to 4800W AC Hot Swap Power Supplies<br>80 PLUS® silver or better efficiency<br>Intelligent Power Management |
| **Operating Temp.** | 35 C |
| **Support** | Managed Life Support (5-7 years) |
| **Availability** | PoC available for trial now |


# APM's 3rd Generation Server Solution

# X-Gene® 3 Overview

## Processor Subsystem

- 32 ARM™ v8 64-bit CPU cores at up to 3 GHz

## Memory

- Eight DDR4-2667 channels – 1TB per socket

## Connectivity

- 42 lanes of PCIe Gen 3

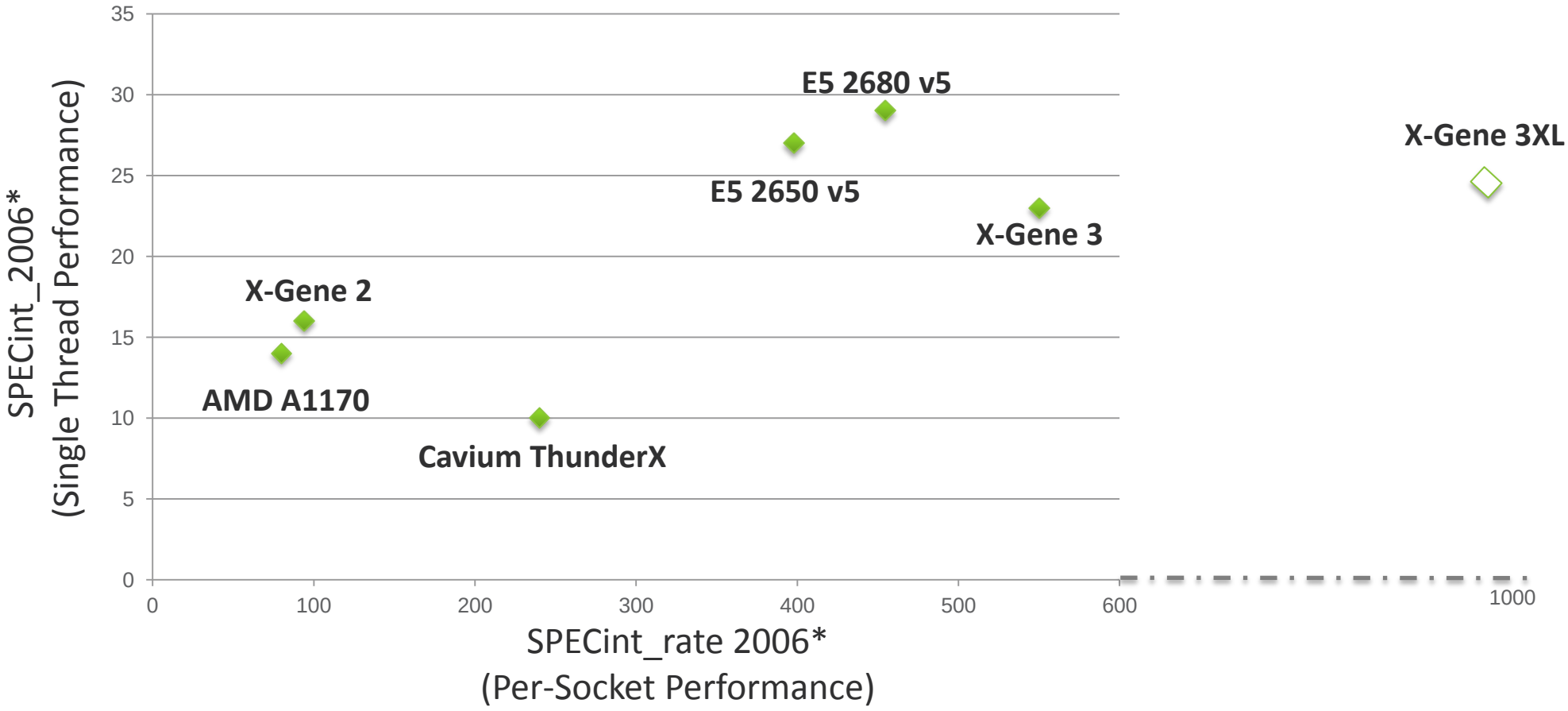
## Performance

- 6X performance versus current generation
- Intel Xeon® Skylake E5 class socket performance

## Sampling 2H'2016

# Server Processor: Competitive Landscape

* SPECint and SPECint_rate peak, using GCC -03




**X-Gene 3 and 3XL target the compute performance of mainstream E5 sockets**