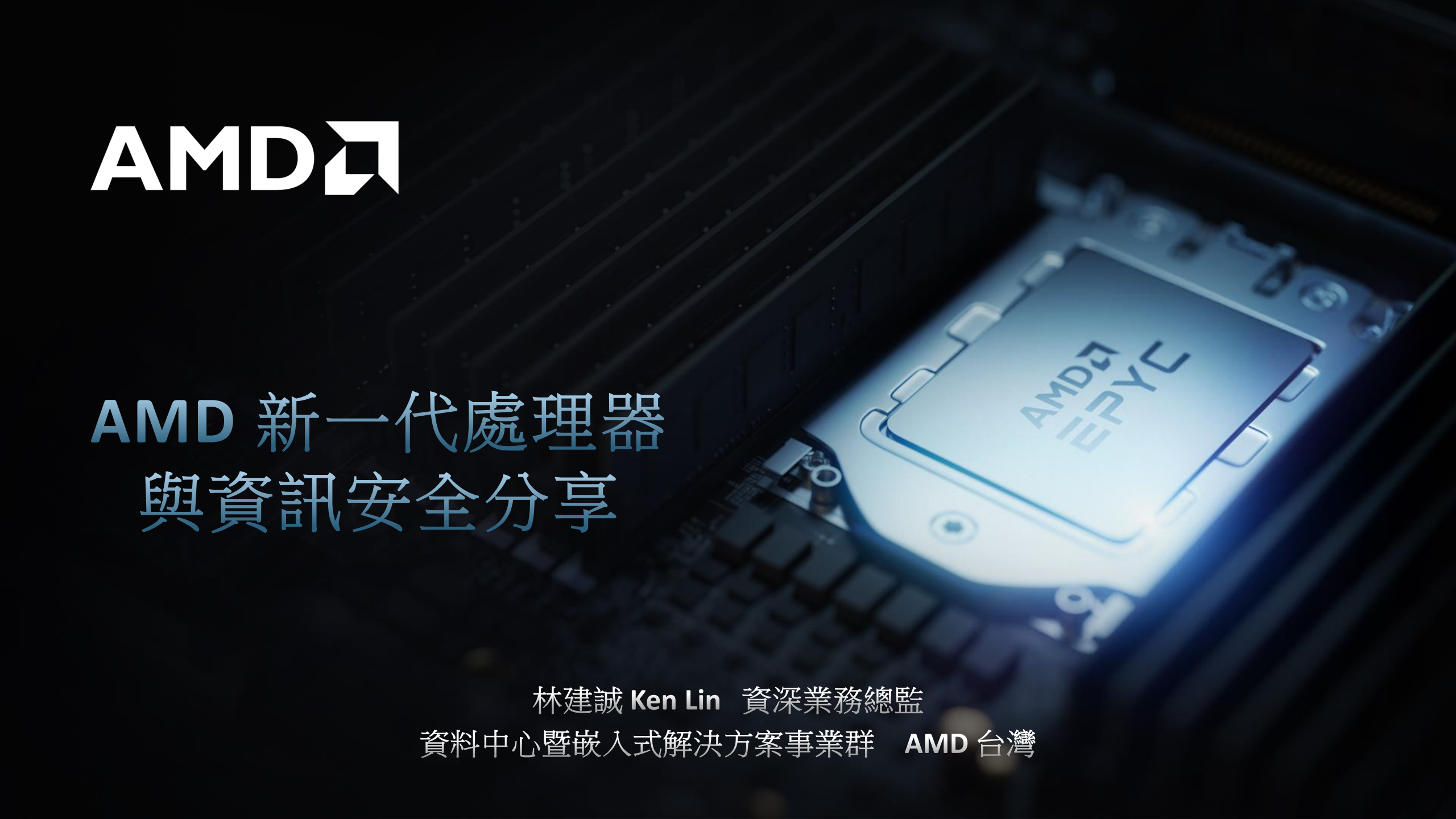


AMD 新一代處理器與資訊安全分享

林建誠 Ken Lin　資深業務總監
資料中心暨嵌入式解決方案事業群　AMD 台灣

HIGH PERFORMANCE COMPUTING

Cloud, Network, Hyperscale & Supercomputing

5G & Comms Infrastructure

AI & Analytics Everywhere

Adaptable Intelligent Systems

Gaming, Simulation and Visualization

Smarter Client Devices & Edge

AT THE CENTER OF TODAY'S WORLD

BIG BETS AND STRONG EXECUTION POSITIONED AMD TO LEAD

ZEN 3

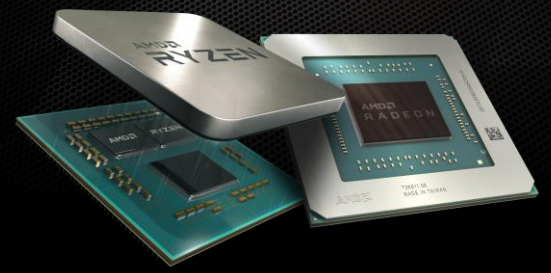
NEW CPU CORE ROADMAP

Multi-generational Roadmap with Leadership Performance and Scalability

AMD RDNA 2

NEW GPU CORE ROADMAP

Uniquely Spans from Console to PC to Mobile



CHIPLET DESIGN

Massive Performance Increases Enabled by Breaking the Constraints of Moore's Law

7nm

7NM LEADERSHIP

Best-in-class Manufacturing Enabling Higher Performance at Lower Power

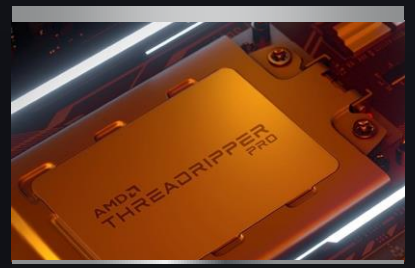
AMD

OUR FOCUS

HIGH-PERFORMANCE COMPUTING SOLUTIONS

AMD EPYC™

AMD INSTINCT™



AMD THREADRIPPER™ PRO

AMD RYZEN™

CONSOLE GAMING

AMD RADEON™

REVENUE TREND

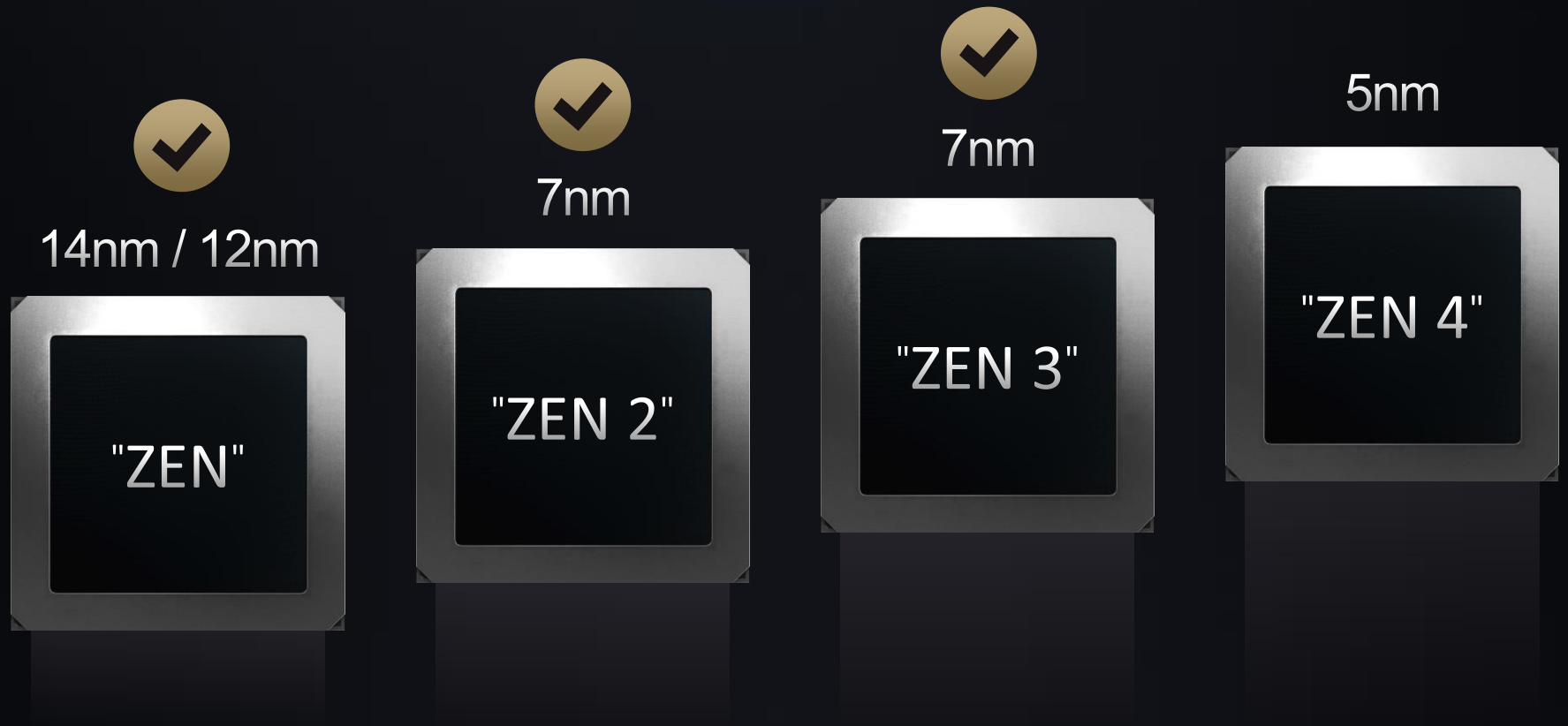
($ IN MILLIONS)

SIGNIFICANT Y/Y REVENUE GROWTH

AMD

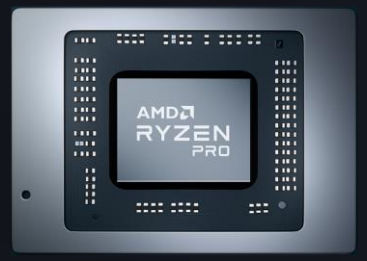
COMPUTE ARCHITECTURE ROADMAP

SUSTAINED HIGH-PERFORMANCE LEADERSHIP



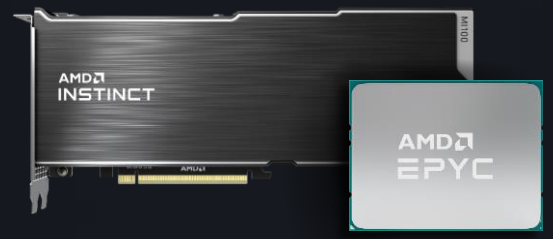
Roadmaps subject to change

ENTERPRISE COMPUTING LEADERSHIP FROM DATA CENTER TO LAPTOP



ENTERPRISE PCs

HP and Lenovo laptop and desktop enterprise portfolios powered by AMD Ryzen™ PRO Processors



DATA CENTER PLATFORMS

AMD Instinct™ MI100 The World's Fastest HPC GPU

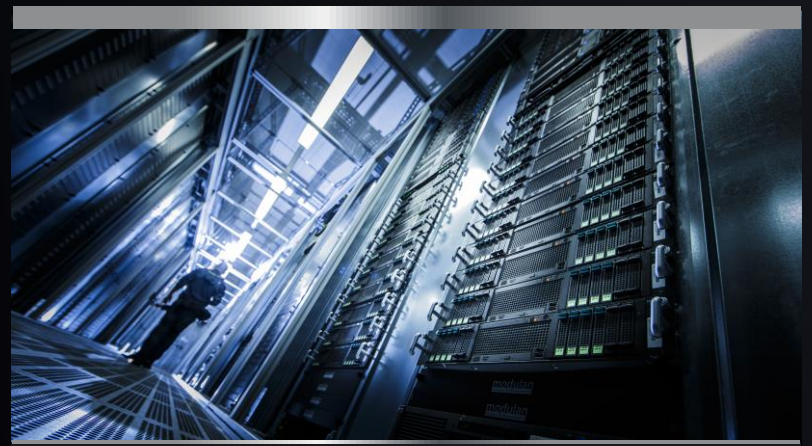
Full portfolio of servers powered by AMD EPYC™ CPUs

WORKSTATIONS

Enterprise workstations powered by AMD Threadripper™ PRO Processors and AMD Radeon™ PRO Graphics

See amd.com/en/claims/epyc#faq-MI100-03

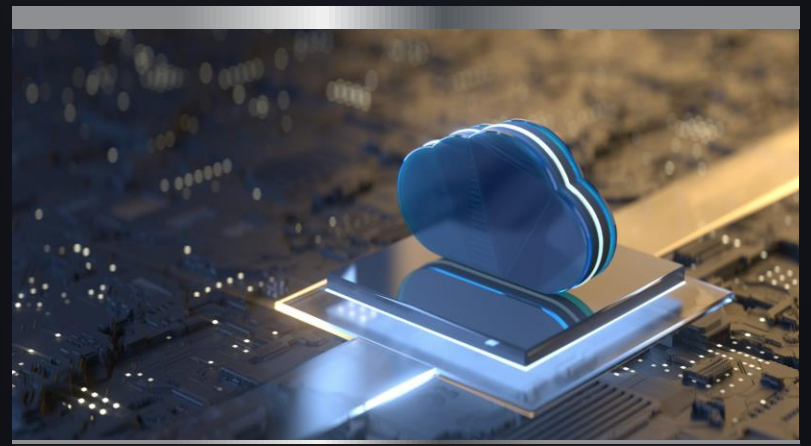
PERFORMANCE LEADERSHIP



ENTERPRISE

Up To **2x** Faster in Enterprise

SPECjbb©2015



CLOUD

Up To **2x** Faster in Cloud

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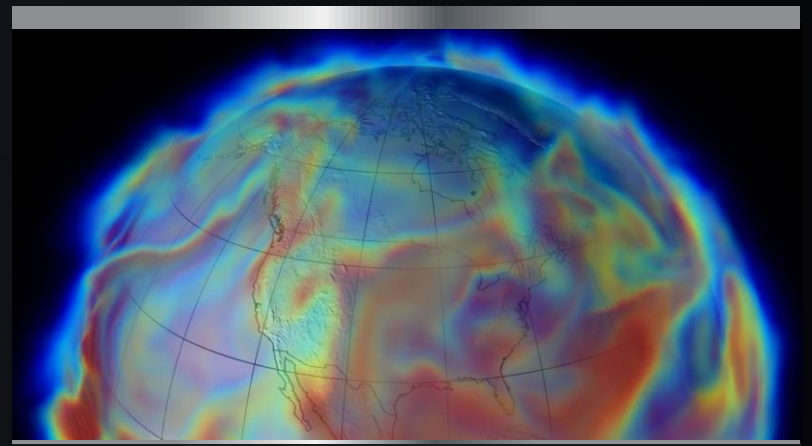


HPC

Up To **2x** Faster in HPC

SPECrate®2017_fp_base

SEE ENDNOTES: MLN-040, MLN-041, MLN-044

PLATFORMS

Atos · ASRock · ASUS · Cisco · Dell Technologies · Foxconn · Gigabyte · H3C · Hewlett Packard Enterprise · Inventec · Lenovo · MiTAC · MSI · QCT · Supermicro · Tyan · Wiwynn · Wistron

INSTANCES

aws · Alibaba Cloud · Microsoft Azure · Google Cloud · IBM Cloud · Oracle Cloud · Tencent Cloud

SOLUTIONS

Altair · Anjuna · Ansys · Beamr · Broadcom · Cadence · Canonical · Casa Systems · Ceph · Citrix · Cloudera · Couchbase · Dassault Systèmes · DataStax · Docker · Elastic · ESI · Excelero · FreeBSD · Hadoop · JMA · Juniper Networks · Kioxia · MariaDB · Mavenir · MemSQL · Mentor · Micron · Microsoft SQL Server · MongoDB · MySQL · NetScout · Nokia · Nutanix · Oracle · PGS Software · PostgreSQL · Quobyte · Radisys · Red Hat · redislabs · Robin · Samsung · ScaleMP · Siemens · SK hynix · Splunk> · StorMagic · SUSE · Synopsys · TigerGraph · Transwarp · Velocix · Vertica · Weka · vmware · Western Digital · Xilinx

AMD EPYC™ CPUs

FAST AND BROAD CLOUD RAMP

aws

Alibaba Cloud

Google Cloud

IBM Cloud

Microsoft Azure

ORACLE CLOUD

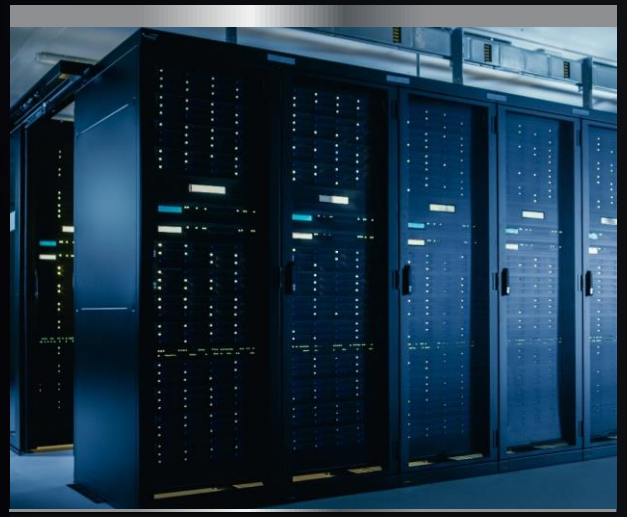
Tencent Cloud

ON TRACK TO 400+ INSTANCES IN 2021

台積電宣布採用AMD第2代EPYC投入新世代研究以及尖端製程技術的研發

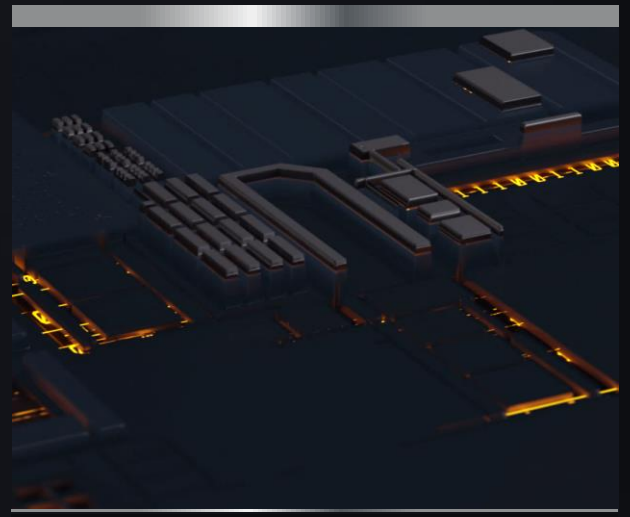
TSMC announced its adoption of 2nd Gen AMD EPYC helping power its next generation research and leading process technology

ENTERPRISE CHALLENGES



IT Infrastructure

Data Management



Insatiable Compute

Security Threats

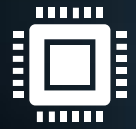
AMD INFINITY GUARD

MODERN SECURITY
BY DESIGN

張歐佑豪 Simon Chang　產品技術經理
資料中心暨嵌入式解決方案事業群　AMD 台灣

AMD INFINITY GUARD

HELPS MINIMIZE POTENTIAL ATTACK SURFACES AS SOFTWARE IS BOOTED AND EXECUTED AND PROCESSES YOUR CRITICAL DATA



AMD Secure Processor

A hardware root of trust which helps protect confidentiality and integrity of data with minor impact to system performance

Secure Memory Encryption

Full system memory encryption helps defend data against certain cold boot and even physical attacks. Only available on AMD processors.

Secure Encrypted Virtualization

Set of AMD technologies that help protect virtual machines with one of up to 509 unique encryption keys known only to the processor. Only available on AMD processors.

AMD Shadow Stack

Provides hardware-enforced stack protection capabilities to help guard against malware attacks.

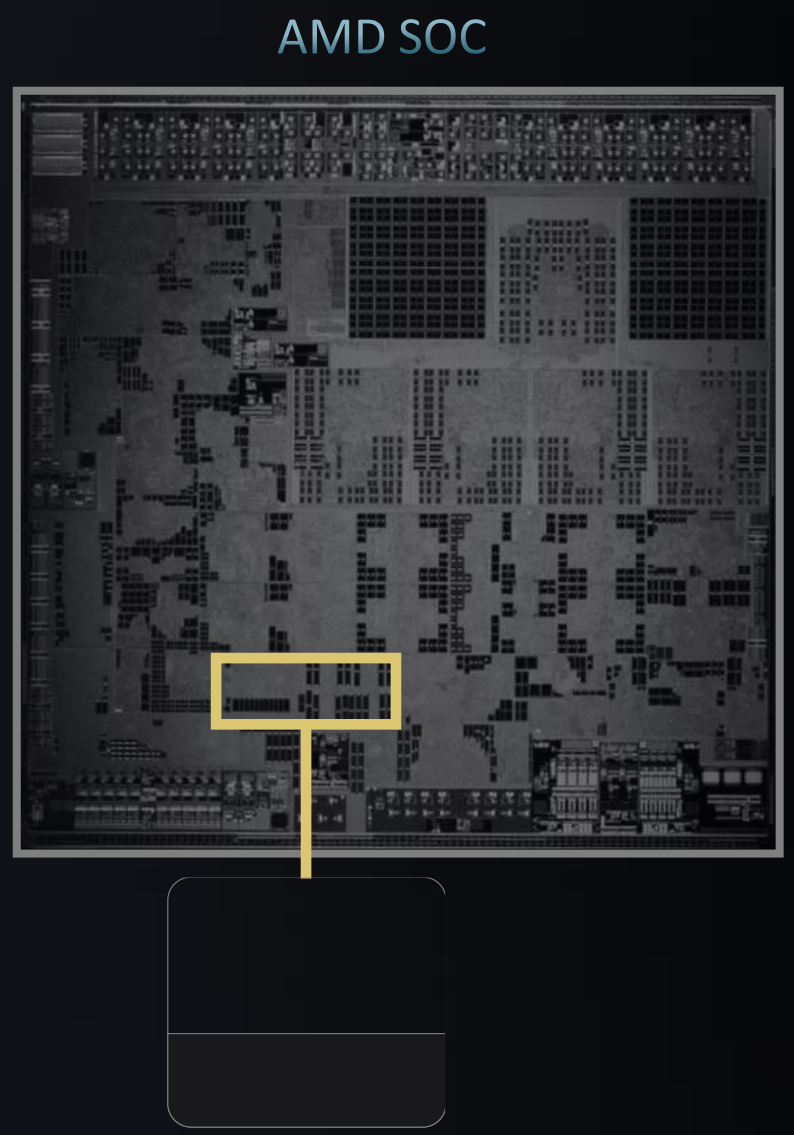
Help your organization ***TAKE CONTROL*** of security and ***DECREASE RISKS*** to your most important assets

AMD Infinity Guard features vary by EPYC™ Processor generations. Infinity Guard security features must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard . GD-183

AMD SECURE PROCESSOR

A DEDICATED SECURITY SUBSYSTEM

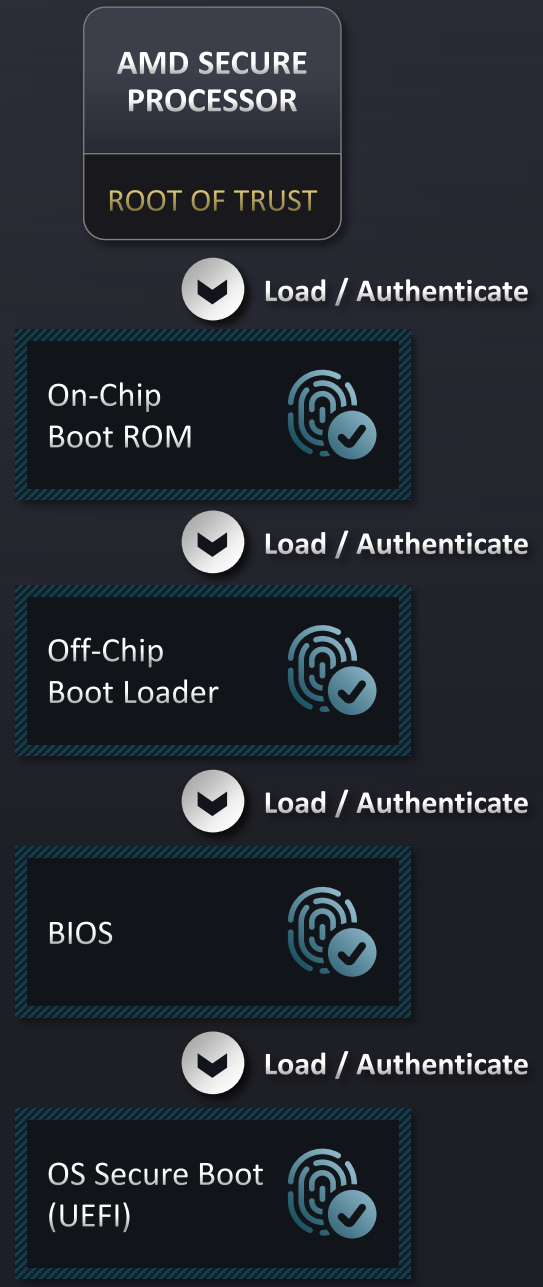
- AMD Secure Processor integrated within SoC
  - 32-bit microcontroller
- Runs an OS/kernel with improved security
- Off-chip NV storage to help protect firmware and data (i.e., SPI ROM)
- Provides cryptographic functionality for key generation and key management
- Enables hardware validated boot



HARDWARE ROOT OF TRUST PROVIDES FOUNDATION FOR PLATFORM SECURITY

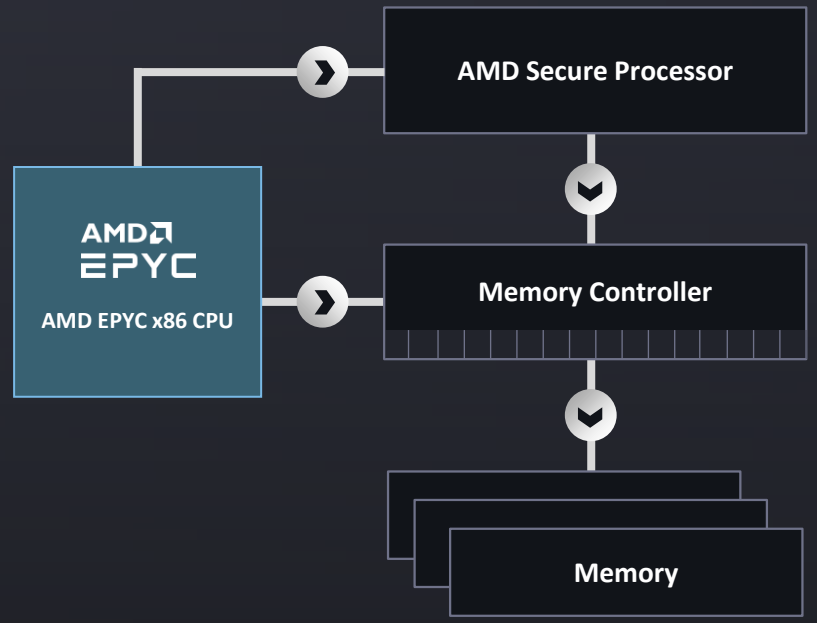
HARDWARE VALIDATED BOOT

- Secure Processor loads the on-chip Boot ROM which loads and authenticates the off-chip boot loader
  - On Chip Boot ROM provides a HW Root-of-Trust and anchors the “Chain of Trust for Firmware modules in HW
- Boot Loader authenticates BIOS before x86 core starts executing the BIOS code
  - Boot Loader also authenticates and loads code for AMD Secure Processor to perform key management
- Once BIOS is authenticated the OS Boot Loader loads the OS or Hypervisor



EPYC™ HARDWARE BASED MEMORY ENCRYPTION

- AES-128 engine in the memory controller
  - Encryption keys managed by AMD Secure Processor / not exposed to x86 CPU
  - Guest OS chooses pages to encrypt via page tables
  - No changes to end user applications needed
- AMD Secure Memory Encryption (SME)
  - All system memory is encrypted using randomly generated key on each system reset
  - Transparent SME is OS agnostic and not visible to OS
- AMD Secure Encrypted Virtualization (SEV)
  - Provides strong cryptographic isolation between the VMs, as well as between the VMs and the hypervisor
  - Active encryption key selected by virtual machine ID



AMD EPYC	UNIQUE MEMORY KEYS
7001	**16**
7002	**509**
7003	**509**

AMD SHADOW STACK

- With 3rd Gen AMD EPYC™ Processors, AMD Shadow Stack provides hardware-enforced stack protection capabilities to help guard against malware attacks.
- This security feature addresses threat vectors such as return oriented programming attacks. It helps by keeping a record of all the return addresses so a comparison can be made to ensure integrity is not compromised.
- In addition, AMD Shadow Stack enables Microsoft® hardware enforced stack protection.

AMD Infinity Guard features vary by EPYC™ Processor generations. Infinity Guard security features must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard . GD-183

STRONG SECURITY GETS STRONGER

3RD GEN AMD EPYC™ SECURITY FEATURES

Secure Root-of-Trust Technology

Only AMD Offers Full Secure Memory Encryption (SME)

Secure Encrypted Virtualization (SEV)

Secure Nested Paging (SEV-SNP)

AMD Shadow Stack

DIFFERENCES BETWEEN GENERATIONS		AMD EPYC™ PROCESSORS		
FEATURE	**NOTES**	**"ZEN"**	**"ZEN 2"**	**"ZEN 3"**
SME	Helps Protect Data in DRAM by Encrypting System Memory Content	✓	✓	✓
SEV	Encrypts Each VM with Unique Keys	✓	✓	✓
SEV-ES	Provides Layer of CPU Registration Protection	✓	✓	✓
SEV-SNP	Provides Memory Integrity Protection			✓
GMET	Enables Hypervisor to Efficiently Handle Code Integrity Check and Help Protect Against Malware		✓	✓
Shadow Stack	Adds Protection Against Control Flow Attack			✓
IBC	Indirect Branch Control	✓	✓	✓

AMD Infinity Guard features vary by EPYC™ Processor generations. Infinity Guard security features must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard. GD-183

VIRTUAL MACHINES POWERED BY AMD

POWERED BY AMD EPYC™ CPUS + AMD SECURE ENCRYPTED VIRTUALIZATION

Google Cloud

vmware®

Microsoft Azure

First VMs enabled by advanced security technology with SEV on 2nd Gen AMD EPYC

VMware® enables SEV-ES in vSphere® for VMs & Containers on 2nd and 3rd Gen EPYC

First VMs announced to support SEV-SNP on AMD 3rd Gen AMD EPYC

NETWORKING MARKET TRENDS

SECURITY

Rapid increase of cyber attacks drives Security market growth

Firewalls continue to be the largest segment of the Security market

Server-based and Cloud-based Security solutions growing fastest

ROUTING AND SWITCHING

5G drives growth in SP routing

Deployment of Virtualized Routers at the Core and at the Edge

Accelerated adoption of 100G in Enterprise & DC switching

SD-WAN

SD-WAN is growing fast - $4.6B in 2024

New services drive performance requirements

Strong M&A activity: Cisco/Viptela, VMware/Velocloud, HPE/Silver Peak, Oracle/Talari

5G / TELCO EDGE

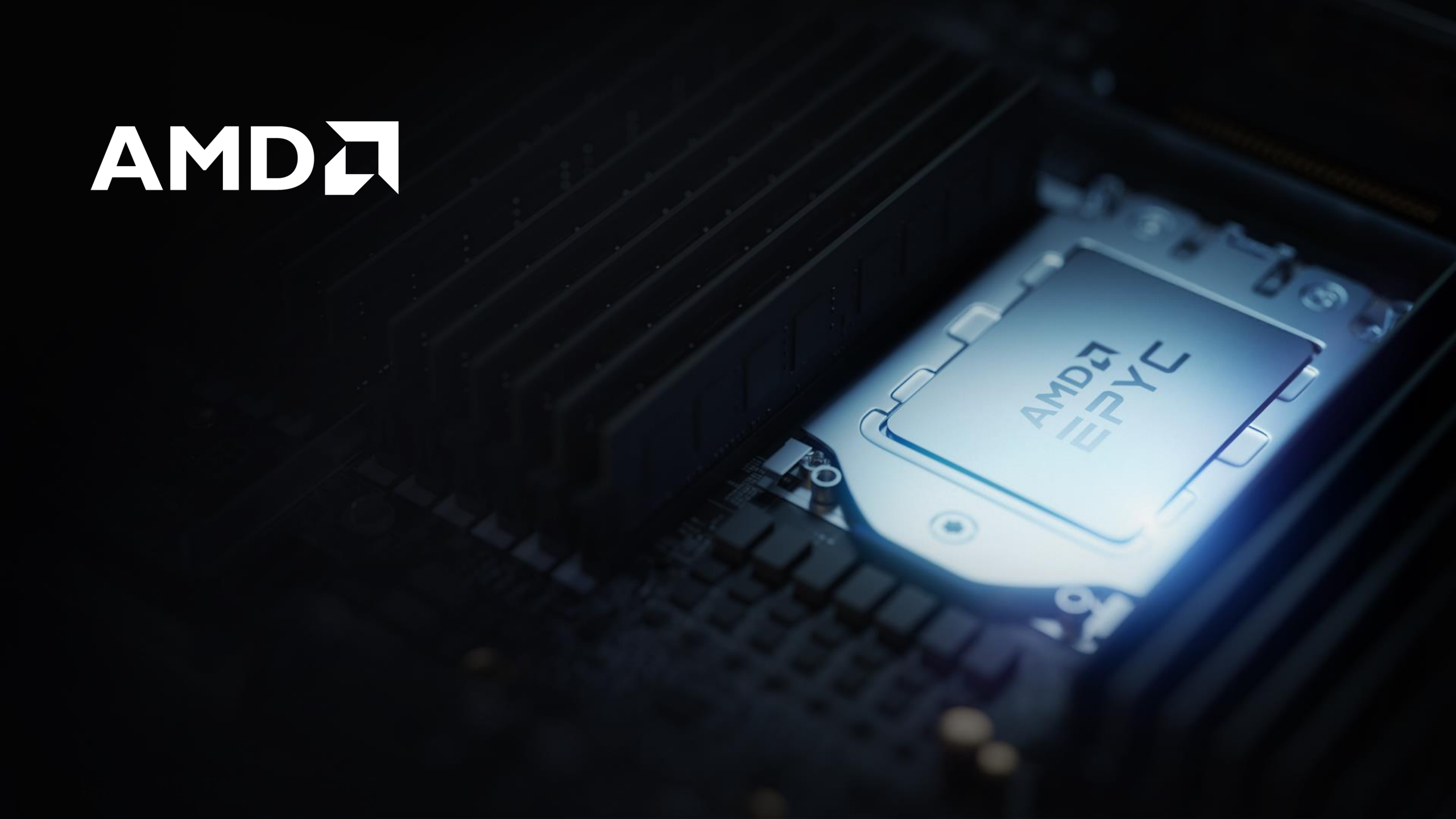
Disaggregation of the RAN

Open RAN gaining momentum – Flexibility, vendor choice, TCO

Raising role of ISVs

AMD


AMD
卓越效能 引領先鋒
新一代 AMD EPYC™ 7003 解決方案高峰論壇
5月18日 台北萬豪酒店 邀您一同共襄盛舉
AMD
EPYC
活動詳情


AMD
AMD
EPYC

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AMD

END NOTES

MI100-03 - Calculations conducted by AMD Performance Labs as of Sep 18, 2020 for the AMD Instinct™ MI100 (32GB HBM2 PCIe® card) accelerator at 1,502 MHz peak boost engine clock resulted in 11.54 TFLOPS peak double precision (FP64), 46.1 TFLOPS peak single precision matrix (FP32), 23.1 TFLOPS peak single precision (FP32), 184.6 TFLOPS peak half precision (FP16) peak theoretical, floating-point performance. Published results on the NVidia Ampere A100 (40GB) GPU accelerator resulted in 9.7 TFLOPS peak double precision (FP64). 19.5 TFLOPS peak single precision (FP32), 78 TFLOPS peak half precision (FP16) theoretical, floating-point performance. Server manufacturers may vary configuration offerings yielding different results.

MLN-040 - Results as of 02/20/2021 using SPECrate®2017_int_base. The 2P AMD EPYC 7763 has a measured estimated score of 804, versus the current highest score Intel Cascade Lake Refresh server with a score of 397 using 2P Intel Gold 6258R, https://spec.org/cpu2017/results/res2020q3/cpu2017-20200915-23981.pdf. OEM published score(s) for EPYC may vary. SPEC®, SPECrate® and SPEC CPU® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.

MLN-041 - Results as of 02/20/2021 using SPECrate®2017_fp_base. The 2P AMD EPYC 7763 has a measured estimated score of 625 versus the current highest score Intel Cascade Lake Refresh server with a score of 309 with a 2P Intel Gold 6258R based server, https://spec.org/cpu2017/results/res2020q3/cpu2017-20200915-23979.pdf. OEM published score(s) for EPYC may vary. SPEC®, SPECrate® and SPEC CPU® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.

MLN-044 - SPECjbb®2015-MultiJVM Critical-jOPS comparison based on Supermicro compliant run and best spec.org published 2x Intel Xeon Platinum 8280 result as of 02/22/2021. The 2x AMD EPYC 7763 has a score of 295,335 SPECjbb®2015-MultiJVM Critical-jOPS (351,175 SPECjbb®2015-MultiJVM Max-jOPS) using the following configuration: Supermicro A+ AS-1124US-TNRP Server (Model H12DSU-iN), 2x AMD EPYC 7763, 16x 64 GB Quad-Rank LR-DIMM DDR4-3200 memory, SUSE Enterprise Linux 15 SP2, OpenJDK 15.0.2. Versus the highest published SPECjbb®2015-MultiJVM Critical-jOPS score of a 2x Intel Xeon Platinum 8280 server of 138,942 SPECjbb®2015-MultiJVM Critical-jOPS (165,958 SPECjbb®2015-MultiJVM Max-jOPS), http://www.spec.org/jbb2015/results/res2019q2/jbb2015-20190314-00428.html for ~112% more [~2.12x the] performance. SPEC® and SPECjbb® are trademarks of the Standard Performance Evaluation Corporation. See more at www.spec.org.

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