

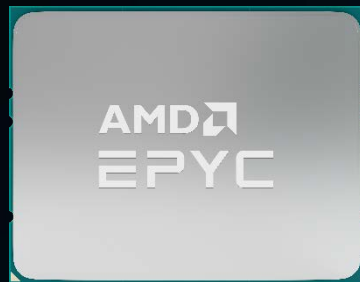


AMD advantage for advancing HPC performance

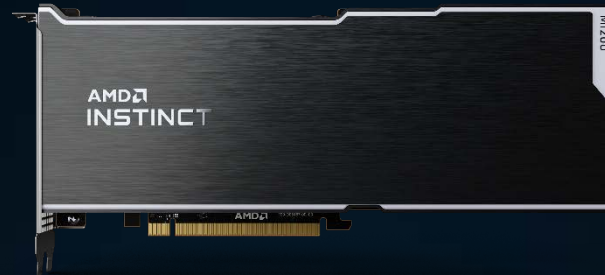
Sid Karkare



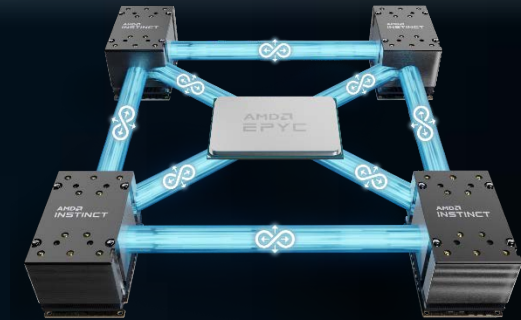
# ACCELERATED COMPUTING LEADERSHIP



CPU



GPU



EXASCALE



# AMD HERITAGE



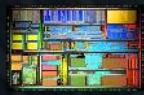
Am2501: first AMD Proprietary Device

1970



Industry's First Graphics Board Compatible with Every Monitor, Graphics Interface and Software

1986



First Independently Designed, Socket-Compatible x86 Microprocessor

1987



Introduced Fastest x86 Processor Available

1995



World's First x86-64 Bit Architecture

1996



First to Break 1GHz GPU Barrier

1997



Inside Every Major Gaming Console

1999



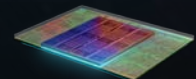
First 32-Core HEDT CPU

2000



World's First 7nm Datacenter GPU

2003



First 3D Stacked Cache

2006

Industry's first 1-million-bit EPROM



Industry's First 3D Graphics Chip



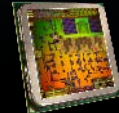
Helped Drive PC Prices <\$1K for First Time



First to Break the Historic 1GHz Barrier



First to Break teraFLOPS GPU Performance Barrier



World's First APUs



First 32-Core Datacenter CPU



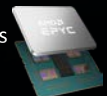
First 4K Game Consoles



First 16-Core HEDT Processor



First Heterogeneous Chiplet CPUs



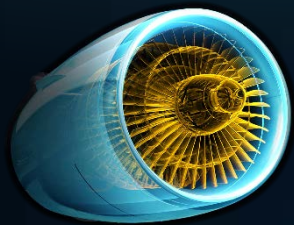
2021/2

# CHALLENGING DATA CENTER WORKLOADS

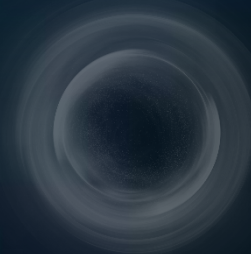
DEMAND ACCELERATED COMPUTING INNOVATION



GENERAL PURPOSE  
COMPUTING



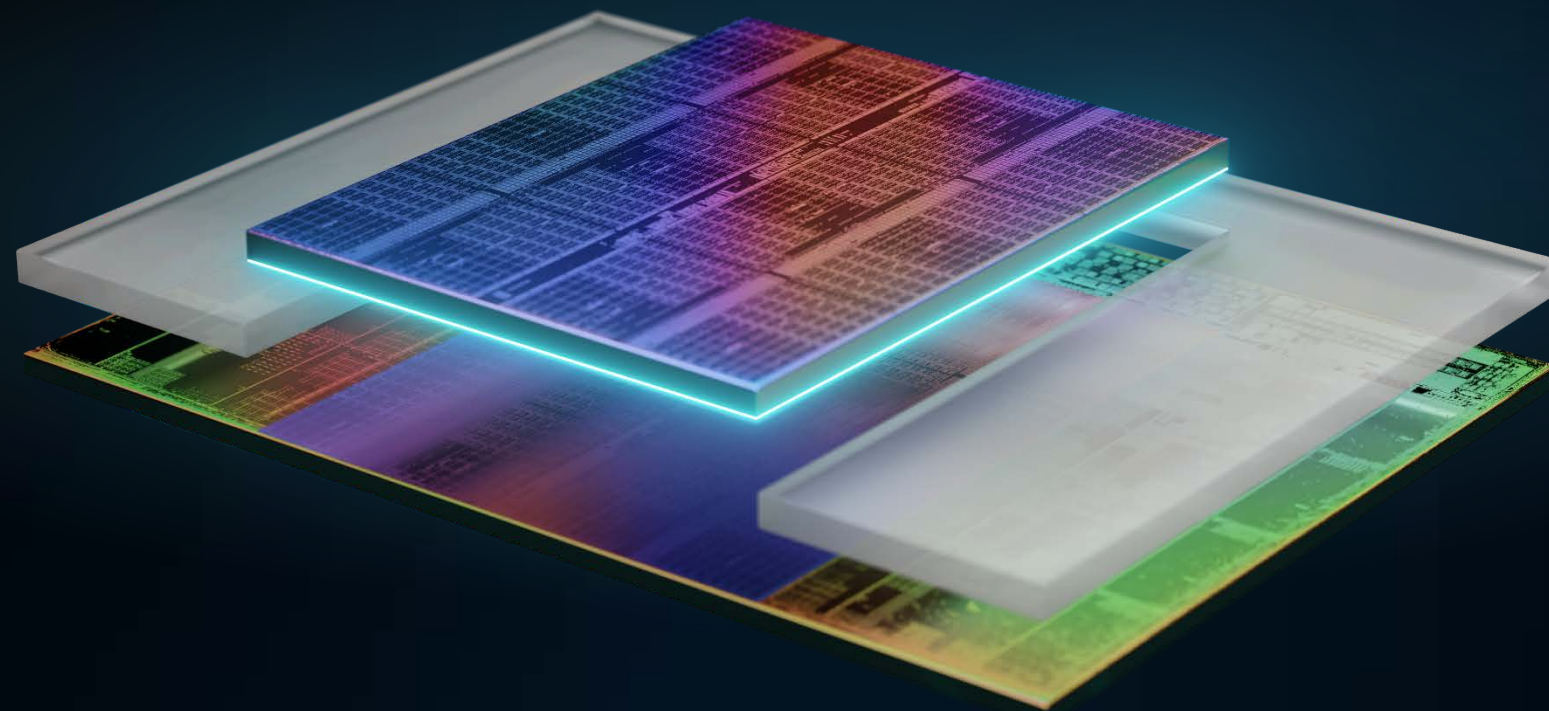
TECHNICAL  
COMPUTING



ACCELERATED  
COMPUTING



CLOUD-NATIVE  
COMPUTING



# WORLD'S FIRST SERVER CPU WITH 3D CHIPLET TECHNOLOGY

# 3<sup>rd</sup> GEN AMD EPYC™ WITH AMD 3D V-CACHE™ TECHNOLOGY

3X

L3 CACHE\*

UP TO 768MB

L3 CACHE PER SOCKET

UP TO 64

“ZEN 3” CORES

SP3

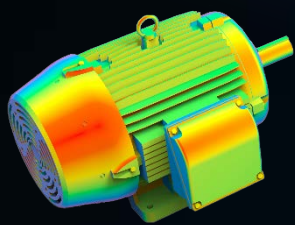
SOCKET COMPATIBLE

\*3<sup>rd</sup> Gen AMD EPYC™ Processors with AMD 3D V-Cache have 768MB of L3 Cache, while 3<sup>rd</sup> Gen EPYC processors without AMD 3D V-Cache have 256MB

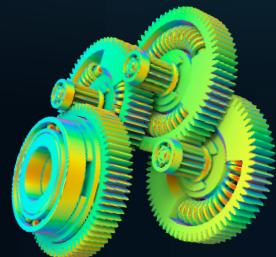




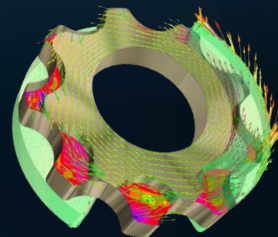
# DESIGNED FOR TECHNICAL COMPUTING



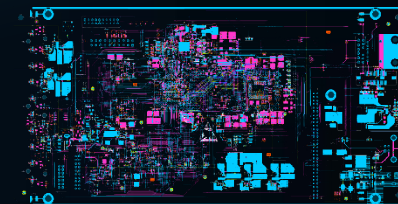
FINITE ELEMENT  
ANALYSIS



STRUCTURAL  
ANALYSIS

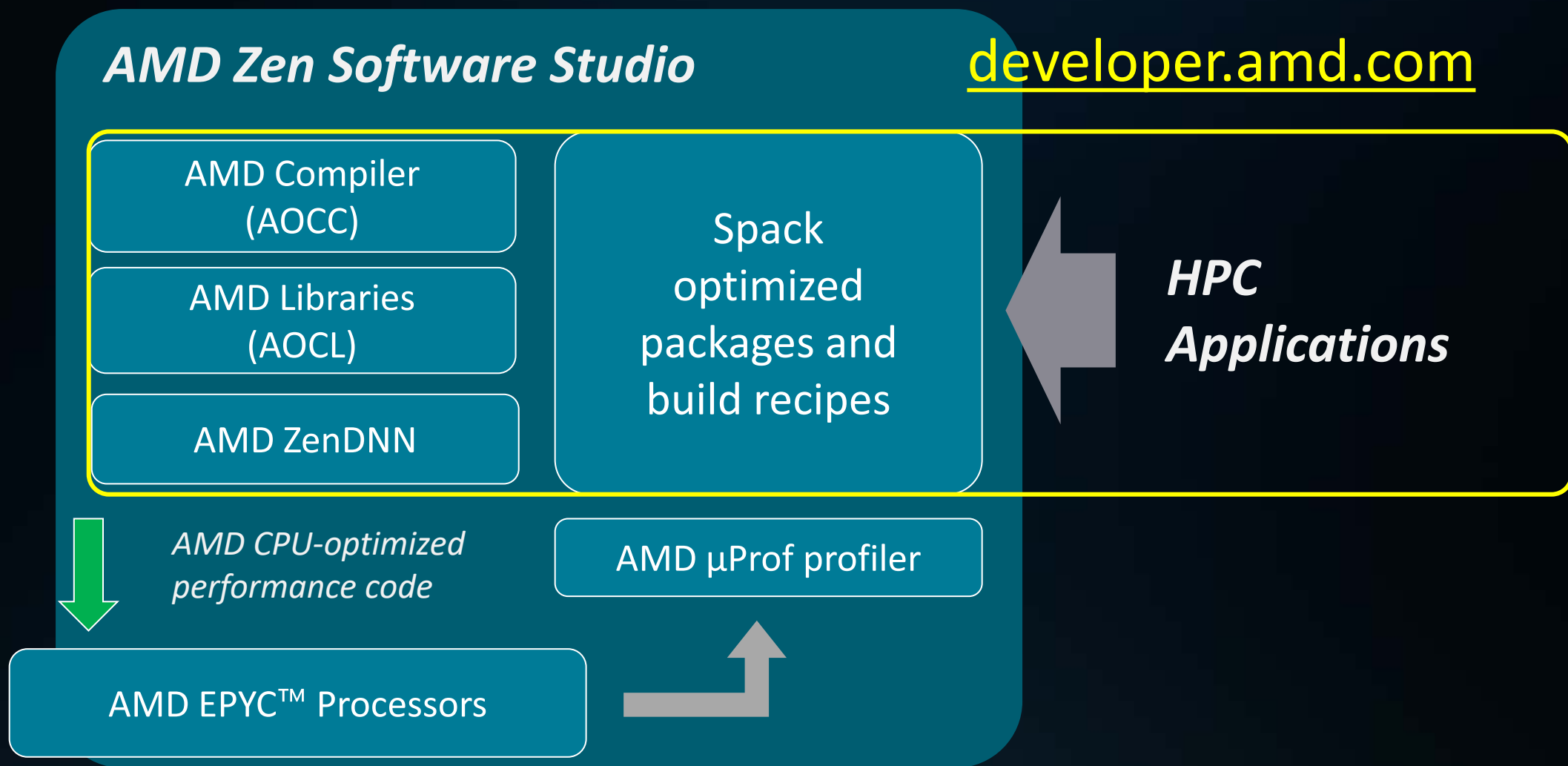


COMPUTATIONAL  
FLUID DYNAMICS



ELECTRONIC DESIGN  
AUTOMATION

# AMD Zen Software Studio for optimized application performance





# CHALLENGING DATA CENTER WORKLOADS

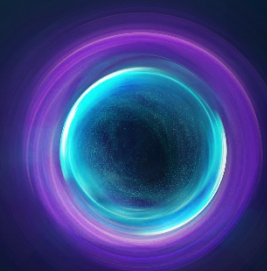
DEMAND ACCELERATED COMPUTING INNOVATION



GENERAL PURPOSE  
COMPUTING



TECHNICAL  
COMPUTING



ACCELERATED  
COMPUTING



CLOUD NATIVE  
COMPUTING

# AMD INSTINCT™ MI200 SERIES



AMD INSTINCT™  
MI200 OAM SERIES

MI250, MI250X



AMD INSTINCT™  
MI200 PCIe® SERIES

MI210

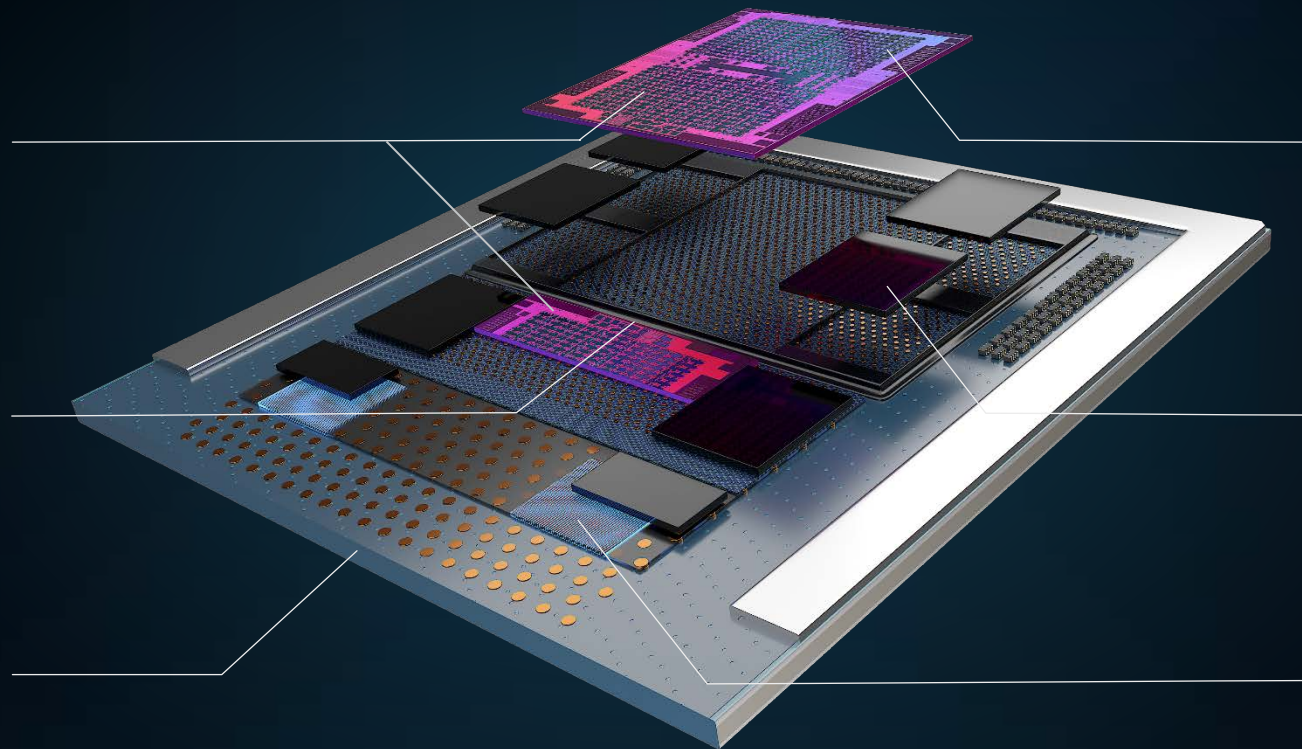
# AMD INSTINCT™ MI200 SERIES

## KEY INNOVATIONS

TWO AMD CDNA™2  
CHIPLETS

ULTRA HIGH BANDWIDTH  
CHIPLET INTERCONNECT

COHERENT CPU-TO-GPU  
INTERCONNECT

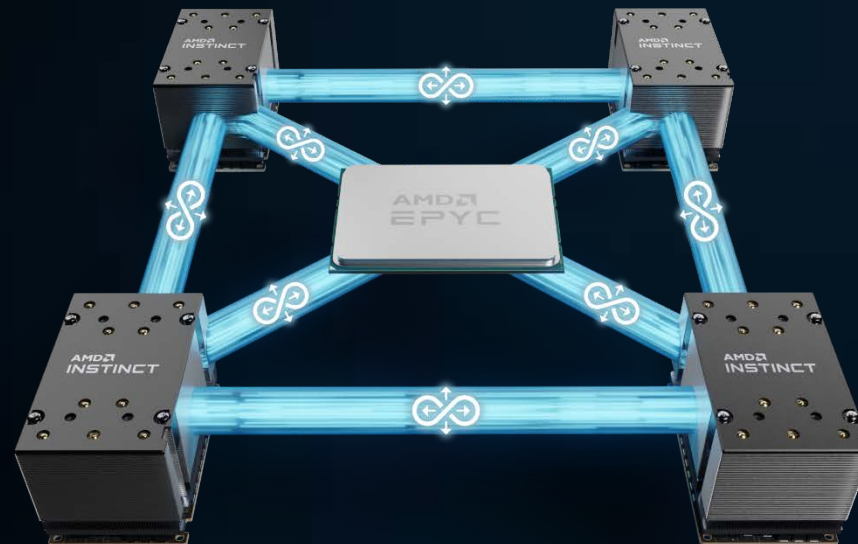


2<sup>nd</sup> GEN MATRIX  
CORES FOR HPC & AI

EIGHT STACKS  
OF HBM2E

2.5D ELEVATED  
FANOUT BRIDGE (EFB)

AMD INSTINCT™ MI200 OAM SERIES



# 3<sup>rd</sup> GEN AMD INFINITY ARCHITECTURE

## ENABLING UNIFIED COMPUTE AT EXASCALE

REMOVING  
BARRIERS

Exceptional System  
Bandwidth & Performance

PROGRAMMER  
PRODUCTIVITY

CPU & GPU  
Memory Coherency

ACCESSIBLE  
PERFORMANCE

Designed to make it easier to  
accelerate legacy codes on GPUs



# ROCm™ Open Software Platform for GPU Compute

DRIVING MAINSTREAM ADOPTION & ECOSYSTEM ENABLEMENT

Applications	HPC Apps		ML Frameworks	
Cluster Deployment	Singularity	SLURM	Docker	Kubernetes
Tools	Debugger	Profiler, Tracer	System Valid.	System Mgmt.
Portability Frameworks	Kokkos	RAJA	GridTools	ONNX
Math Libraries	RNG, FFT	Sparse	BLAS, Eigen	MIOpen
Scale-Out Comm. Libraries	OpenMPI	UCX	MPICH	RCCL
Programming Models	OpenMP	HIP	OpenCL™	Python
Processors	CPU + GPU			

**2021: ROCm 4.0**

Production-Ready HPC & ML Stack



**AMD**  
**ROCm 5.0**

EXPANDING SUPPORT & ACCESS

OPTIMIZING PERFORMANCE

ENABLING DEVELOPER SUCCESS

A perspective view of a server room aisle. The aisle is flanked by rows of server racks on both sides. The floor is dark with several large, rectangular, light-colored grates. The ceiling has recessed lighting fixtures. The overall lighting is dim, with a strong blue glow emanating from the racks and floor grates. The text "THE ACCELERATED DATA CENTER" is overlaid in the center of the image in a bright, glowing blue, sans-serif font.

# THE ACCELERATED DATA CENTER

**AMD** 