

# Simulation in Manufacturing

Shrinking **time-to-results** with CFD at **extreme scale**



Microsoft, AMD, and Siemens have teamed up to make simulation-driven product design better, faster, and more cost-effective than ever before on the Cloud. With powerful simulation tools to capture the physics of your product over its operational life, Azure HPC offers foundational infrastructure and services that cut across the traditional boundaries of engineering disciplines.

Incorporating simulations into the manufacturing process addresses several **business challenges**:



## Time to Decision

Safely, sustainably and rapidly deliver innovative, high-quality products to market.



## Prediction

Accurately predict real-world performance / behavior that captures the physics.



## Performance

Empower your people with the right resources and tools.

To nurture, sustain, and future-proof their leadership position, manufacturers require accurate modelling of their products to ensure real world value. Microsoft Azure supports this with:

HBv2 VM

**45%**

higher memory bandwidth than competing alternatives

URL > <https://bit.ly/35DlvOt>

## Azure HBv2 Virtual Machines

HBv2 VMs feature 120 AMD EPYC 7002 Series CPU cores, 340 GB/s of memory bandwidth, and Mellanox 200 Gigabit/sec HDR InfiniBand™.

## AMD EPYC™ 7002 Series Processors

The EPYC 7002 offers 45% higher memory bandwidth than competitive alternatives and PCIe Gen 4.0 to support the most-advanced networking.

## Siemens Simcenter STAR-CCM+

Siemens Simcenter STAR-CCM+ is a CFD-focused multi-physics solution that simulates products and designs operating under real-world conditions.

# Platform performance benchmarks & validation data

## Simcenter STAR-CCM+



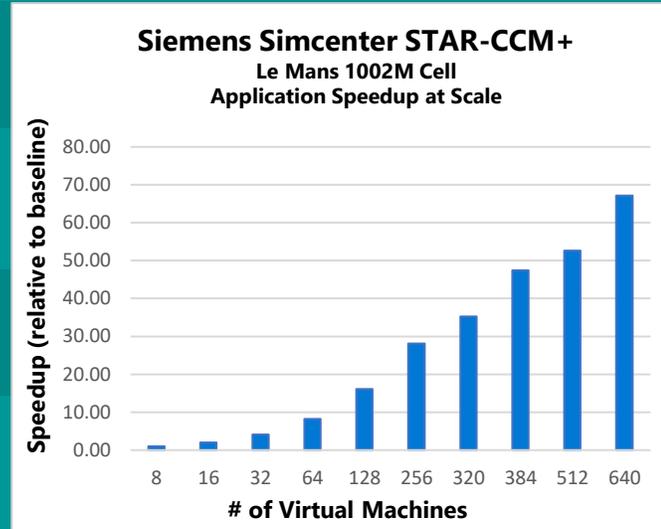
Using one of the highest-scale CFD simulations ever performed with Simcenter STAR-CCM+:

**One billion** cell model of a sports car named after the famed 24 Hours of Le Mans race.

**15,000** parallel processes supported with **linear** efficiency across 128 VMs.

**99%** scaling efficiency at more than **44,000** parallel processes.

At 640 VMs and **57,600** parallel processes, the HBv2 VM delivered **84%** scaling efficiency.



## HBv2 Virtual Machines

Azure HBv2 virtual machines feature 120 EPYC 7002 Series Processors from AMD. These VMs offer supercomputer-class performance, MPI scalability, and cost efficiency for a variety of real-world high-performance computing (HPC) workloads, such as CFD, explicit finite element analysis, seismic processing, reservoir modeling, rendering, and weather simulation.

Specifications:

CPU cores	Memory	Memory per core
<b>120</b>	<b>480 GB</b>	<b>4 GB</b>

Local SSD: GiB	RDMA network	Azure network
<b>1.6 TB</b>	<b>200 Gbps</b>	<b>40 Gbps</b>

## EPYC 7002



### Series Processors

AMD EPYC 7002 Series Processors unlock performance and redefine economics for HPC in Azure. AMD works with the open source community and major software vendors like Siemens to help ensure your applications work exceptionally well with EPYC. AMD's comprehensive coverage of software compatibility and certifications are why Microsoft Azure trusts AMD EPYC processors for its most demanding services. AMD EPYC enables Azure HBv2 customers to achieve ground-breaking HPC performance at a competitive price point.

# 45%

more memory bandwidth than competitive alternatives

# PCIe 4.0

supporting advanced networking capabilities for tightly coupled workloads

Next Steps



[Take this out for a test drive on Azure](https://bit.ly/2xCACv4) (URL: <https://bit.ly/2xCACv4>)

