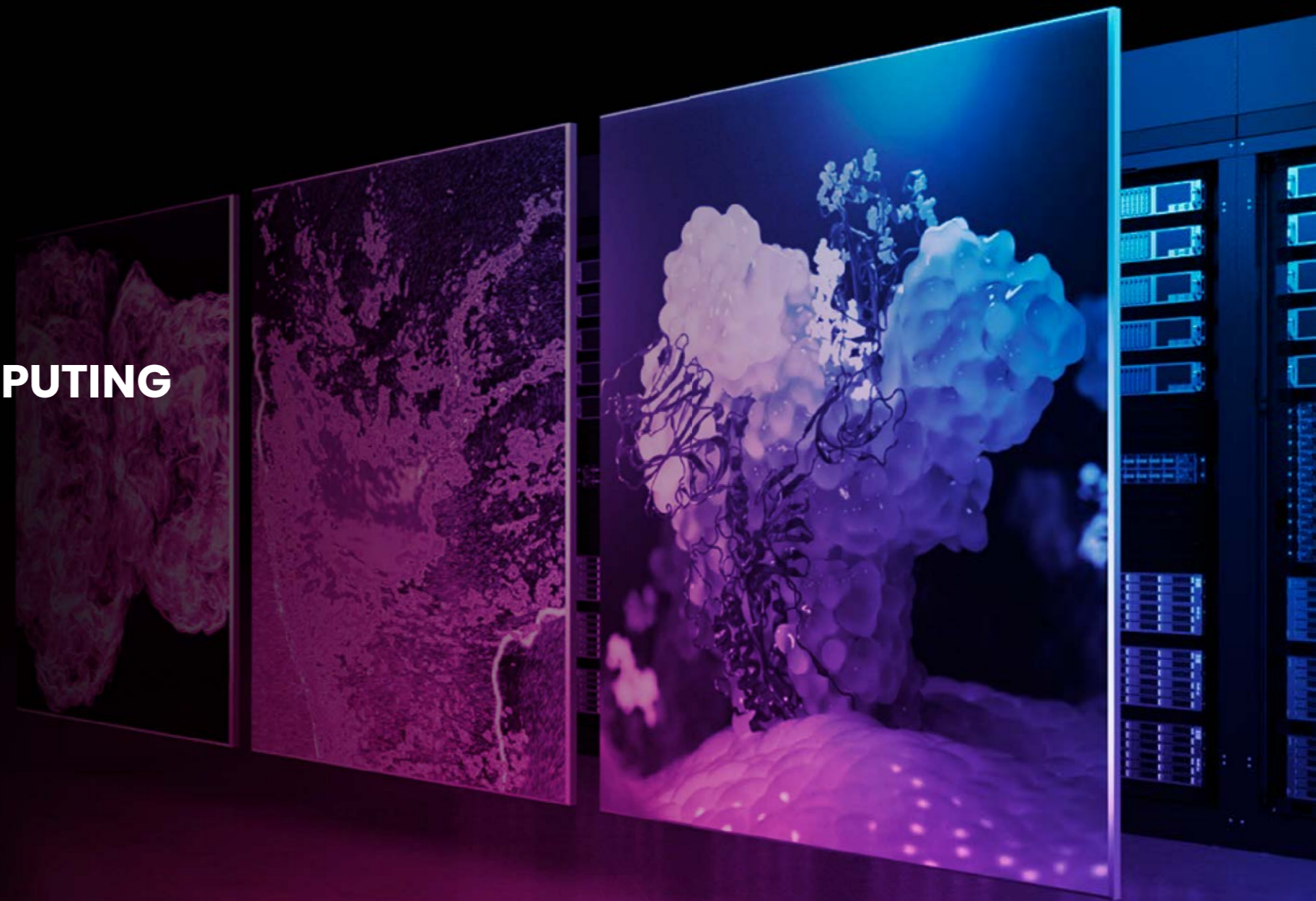
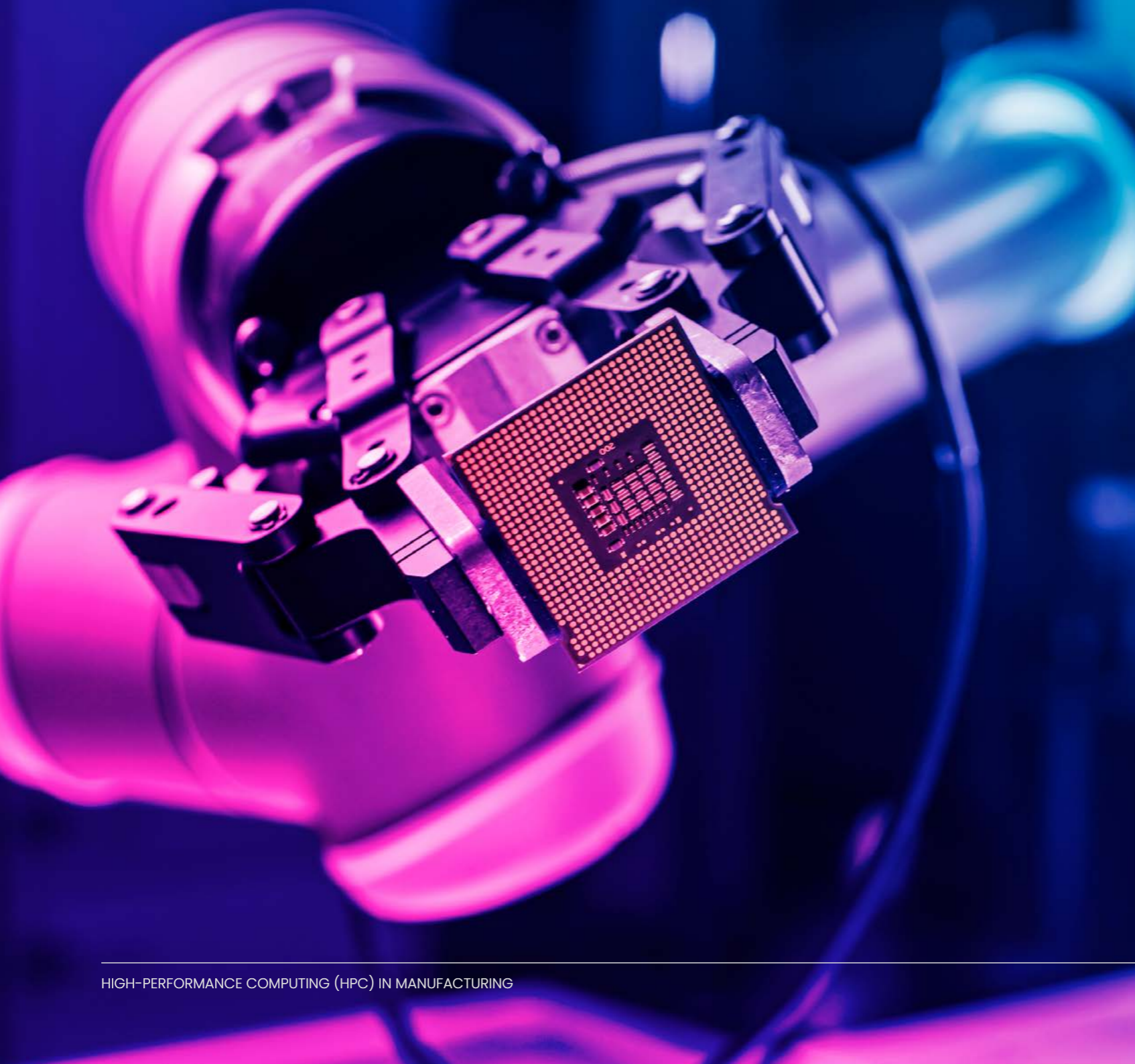


HIGH-PERFORMANCE COMPUTING (HPC) IN MANUFACTURING

OCF AND NVIDIA'S GUIDE
TO HPC IN ACTION





A NEW ERA OF COMPUTING FOR A NEW ERA OF MANUFACTURING

Today's manufacturers must harness data to drive innovation faster and achieve exceptional quality, precision, and profitability across their operations.

HPC offers the raw power needed to process the high volumes of data required to uncover insights and develop innovative solutions at speed. But, despite HPC's many benefits, there are still common concerns for manufacturers considering the technology.

This guide highlights the benefits and real-world use cases of HPC. It explores challenges, and shows how OCF and NVIDIA offer the solutions needed to embrace and take advantage of the benefits of HPC.

THE BENEFITS OF HPC



HPC IS A COMPUTE GAME CHANGER

With HPC, huge workloads can be simulated with more accurate iterations in minutes rather than days or weeks – maximising the time available for the design phase. HPC also reduces dependencies on physical testing, saving resources, time, and money.



HPC ACCELERATES INNOVATION

HPC allows manufacturers to drive innovation in ways that previously weren't possible. Now, machines can be equipped with many more sensors as HPC can process the high volumes of data required. This kind of data-driven predictive maintenance was previously hard to achieve, but HPC-powered AI machine learning makes it possible.



HPC CONSOLIDATES COMPUTE

Manufacturers using HPC can consolidate their compute power into a centralised resource. This allows for far better resource measurement, management, and allocation in a dynamic, effective, and less wasteful way.

It's predicted we'll generate **463 exabytes of data per day** by 2025.¹

HPC performs **quadrillions of calculations per second**.²

97% of global companies with a HPC platform say that they won't survive without one.³

HOW ARE INDUSTRY LEADERS USING HPC?

BMW: THE FACTORY OF THE FUTURE

BMW Group's factory of the future is designed, simulated, operated, and maintained entirely in NVIDIA Omniverse. It's a platform that accelerates HPC visualisation to create physically accurate, simulated digital twins of BMW's factories.

SECTOR: AUTOMOTIVE

HPC: SIMULATION



WORLDWIDE COLLABORATION

BMW's global teams can collaborate from anywhere using software tools and datasets to plan its factories in 3D and real time.



OPTIMISED PLANNING

Factory planners can step into digital human simulations – with real-life physics – to test new workflows for employee ergonomics and efficiency.



ROBOT FLEET MANAGEMENT

With the power of NVIDIA Isaac and Fleet Command, BMW can train, operate, and orchestrate its fleet of robots with ease.



HOW ARE INDUSTRY LEADERS USING HPC?

RJM INTERNATIONAL: REDUCING POWER PLANT EMISSIONS

OCF supported RJM International to develop its first HPC cluster which uses NVIDIA InfiniBand and Intel® Xeon® Platinum 8280 CPUs. The cluster is being used to analyse customers' existing systems and run new-solution simulations for power stations before the prototyping phase. As a result, RJM International can better support its clients to reduce power plant emissions and improve efficiencies.

SECTOR: ENERGY

HPC: SIMULATION



RAPID SIMULATIONS

Computational Fluid Dynamics (CFD) simulations previously took about one week to complete but are now finished within a day – an 86%, on average, reduction in time spent.



OPERATIONAL SAVINGS

With a significant memory capacity, the cluster produces faster results more efficiently, saving resources, time, and budget.



FUTURE-PROOF DESIGN

The cluster is built to handle the increasingly complex and compute-heavy simulations required in the coal, oil, gas, and biomass industries.

WHY ARE MANUFACTURERS HESITANT TO EMBRACE HPC?

SKILLS SHORTAGES

The industry is currently facing a serious skills shortage of HPC-trained experts, especially when delivering at scale. This makes talent acquisition harder for smaller, budget-restricted manufacturers and can mean HPC projects get absorbed by engineers instead.

The shortage also extends to the IT professionals and data architects capable of building and managing HPC systems, and ensuring ongoing compatibility with emerging technologies. An issue that's exacerbated by HPC primarily using Linux over Windows as an OS.

COMPLEXITY AND COSTS

HPC is notoriously complex to set-up, meaning in-house attempts often lead to failure and an assumption that the solution isn't viable.

In addition, HPC set-up is expensive, and systems must be future proofed to allow for dynamic scalability as data demands increase. This often leads to smaller investments being made in workstations instead of HPC solutions.

PERFORMANCE AND SECURITY

Manufacturers depend on efficiently transmitting large data loads at speed between multiple computing nodes, storage devices, and input/output devices.

As a result, many manufacturers are concerned about network performance, interconnect latencies, and data protection when considering a HPC solution.

75% of IT executives say talent shortages are their biggest risk factor in deploying technology.⁴

42% of digital leaders are struggling to find people with data and analytics skills in the UK.⁵

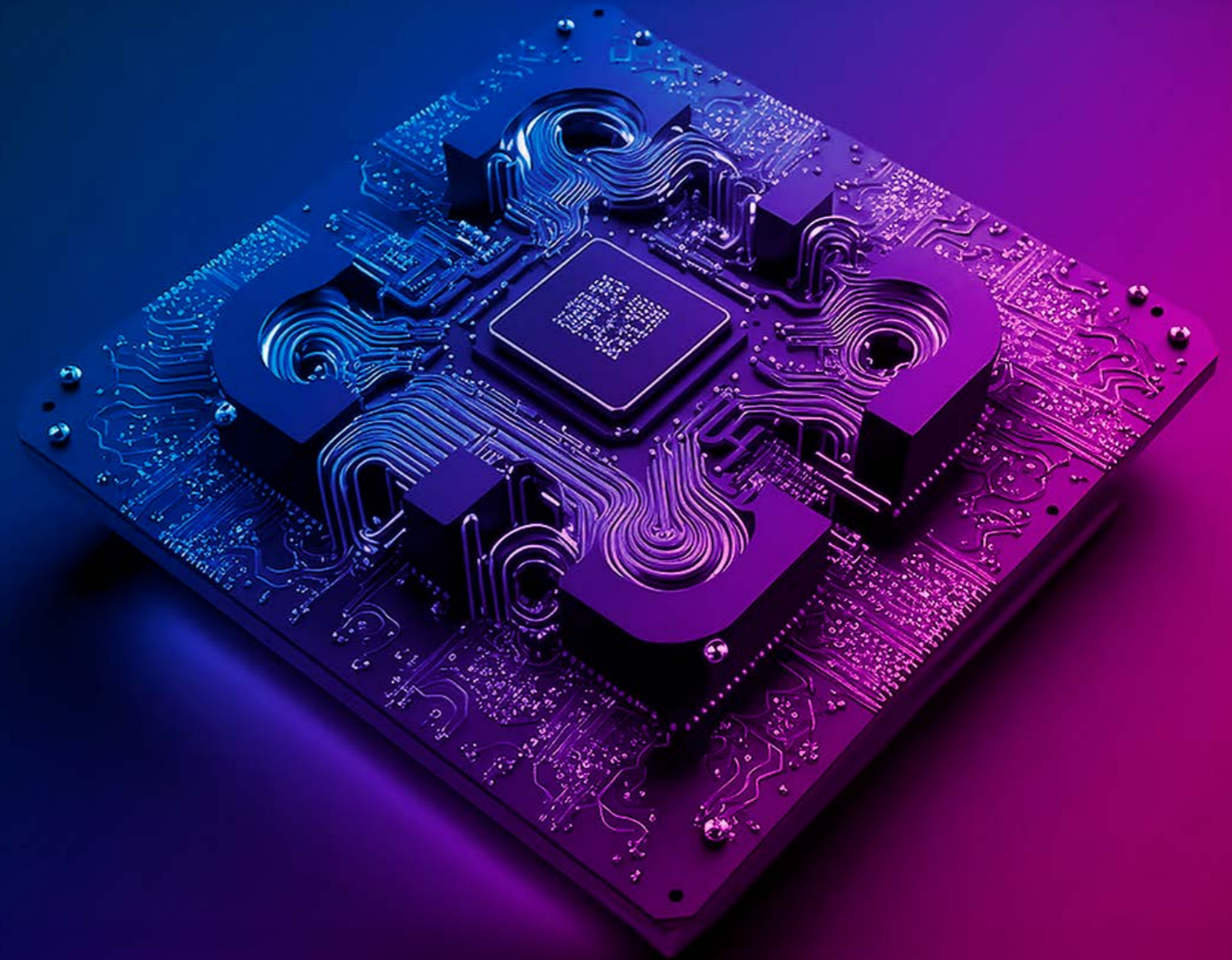


UNLOCK THE POWER OF HPC WITH OCF AND NVIDIA

OCF and NVIDIA empower manufacturers to unlock the full potential of a secure and powerful HPC solution – enabling them to meet existing and future performance demands.

With OCF's HPC expertise, businesses can free up their teams and save resources to focus on driving innovation and realising ambitious goals. It's the next generation of compute power and it's allowing manufacturers to meet existing and future performance demands with complete confidence.

For every **\$1 invested** in HPC, manufacturers generate **\$83 in revenue** with **\$20 of that being profit**.⁶





END-TO-END SOLUTIONS

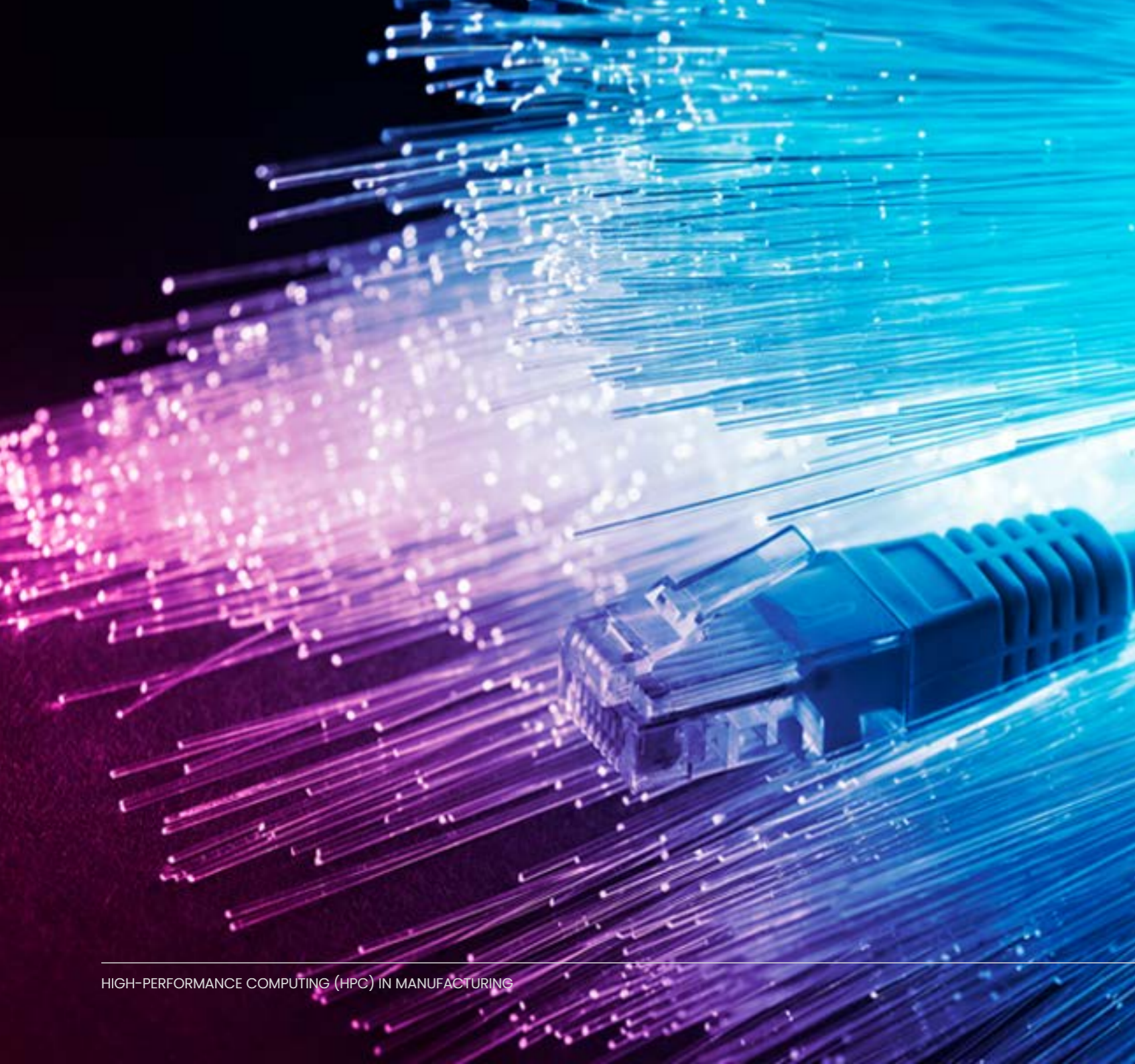
OCF's seasoned industry experts have been helping its customers to address their technical computing challenges for over 20 years. This allows our team to assist first-time HPC buyers and more experienced customers. And, as an Elite NVIDIA partner, OCF provides a true end-to-end journey from initial consultancy through to design and managed services.

A BEST-PRACTICE METHODOLOGY

Every solution is developed by in-house technical architects from tried-and-tested building blocks. This ensures every solution is designed from a best-practice approach before being optimised and tailored to suit specific customer needs.

ONGOING SUPPORT AND TRAINING

Once a solution is in place, OCF's experts provide training and ongoing support to evolve it as business needs and challenges change – maximising the longevity of the HPC investment. If technical skills are unavailable, or you simply want flexibility and 365 cover, OCF offers a managed service to handle the day-to-day administration of a HPC cluster. In addition, OCF provides training sessions to equip every key worker with the HPC knowledge they need to work with confidence.



NVIDIA

END-TO-END SOLUTIONS

NVIDIA's high-performance in-network computing technology enables large amounts of data to be transmitted quickly and efficiently – delivering the greatest possible output from a HPC infrastructure. And with the freedom to choose between InfiniBand or Ethernet, NVIDIA's accelerated networking solutions allow manufacturers to maximise HPC and AI investments on their own terms.

BUILT-IN SCALABILITY

With NVIDIA's networking products, manufacturers gain the flexibility and scalability to manage complex workloads and extreme-sized data sets without compromising on speed. This means manufacturers can start small and scale up – ensuring network growth only occurs when appropriate for minimal wastage and increased savings.

ONGOING SUPPORT

NVIDIA offers extensive support whenever manufacturers use in-house code on NVIDIA GPUs.

END-TO-END HPC SUCCESS STARTS WITH OCF AND NVIDIA

POWERED BY OUR PEOPLE

At OCF, we design our solutions to solve the issues that matter to manufacturers most. It's why we work collaboratively with NVIDIA and other independent software vendors to understand the existing and emerging challenges facing manufacturers.

OCF is driven to uncover the perfect solution for your unique challenges and ambitions. Perhaps, your current IT usage needs to be optimised or updated? Maybe your current in-house applications aren't scalable or compatible with HPC? Our experts are all problem solvers at heart, and these are just some of the questions they ask to identify system bottlenecks and a solution to match.



The global HPC market is set to expand at a 4.4% compound annual growth rate (CAGR) in the next ten years.⁷



TECHNICAL PRE-SALES CONSULTANTS

OCF's experts in solution architecture design, are able to evolve your solution as your demands change.



ACCOUNT MANAGERS

Relationship builders with deep technical expertise, able to understand and act on your short and long-term business demands.



HPC TECHNICAL CONSULTANTS

A team of highly skilled consultants with leading expertise across NVIDIA HPC solutions and its wider portfolio.



IT PROJECT MANAGERS

PRINCE2 certified and highly experienced in delivering NVIDIA HPC solutions using proven methodologies.

OCF'S END-TO-END PROCESS



RESEARCH

OCF's experts explore your business' short and long-term compute needs and challenges.



DESIGN

The OCF team explores different HPC options to suit your defined business requirements, budget constraints, and timeline goals.



PRESENT

OCF presents you with everything our team has learned, including any insights and recommendations, before we agree on an approach.



DOCUMENT

You receive a detailed document outlining the approach and plan for implementation.



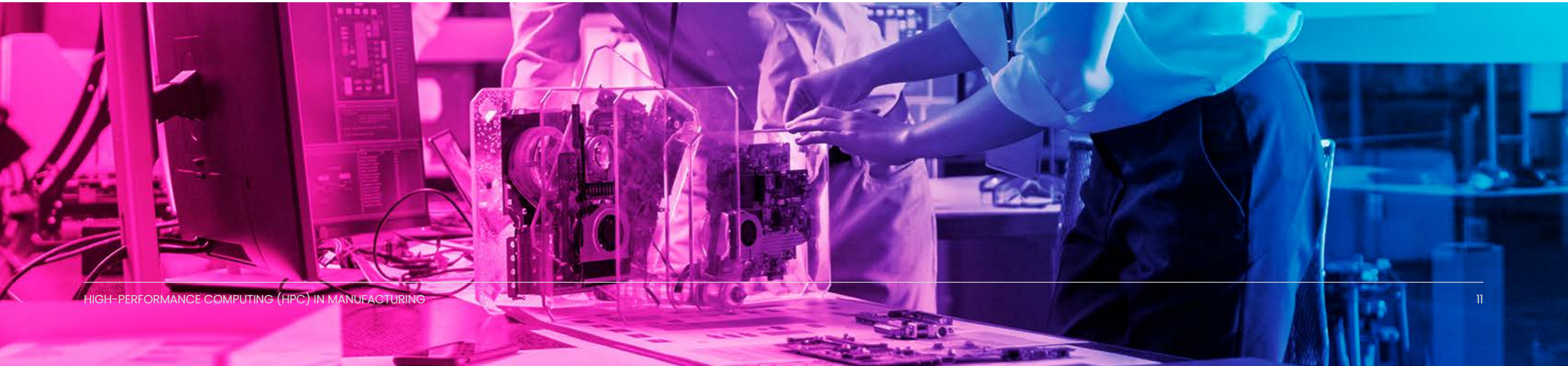
IMPLEMENT

OCF's technical experts work to deliver the solution.



REVIEW

OCF's team measures success to develop future optimisation and strategies.





CONTACT OCF FOR NVIDIA TODAY

HPC has unlocked new possibilities for manufacturers. It's accelerating innovation, saving crucial resources, consolidating compute power, and more. But realising its true potential in manufacturing is only possible through the industry-leading OCF and NVIDIA partnership.

At OCF, our seasoned experts support you end to end. By getting to know your unique challenges and ambitions, we can pinpoint the perfect-fit HPC solution to transform your teams, innovation, and operations.

To start exploring the power of HPC, please contact an expert at OCF.

Contact now