Delivering a simulation and modelling service on HPC cloud

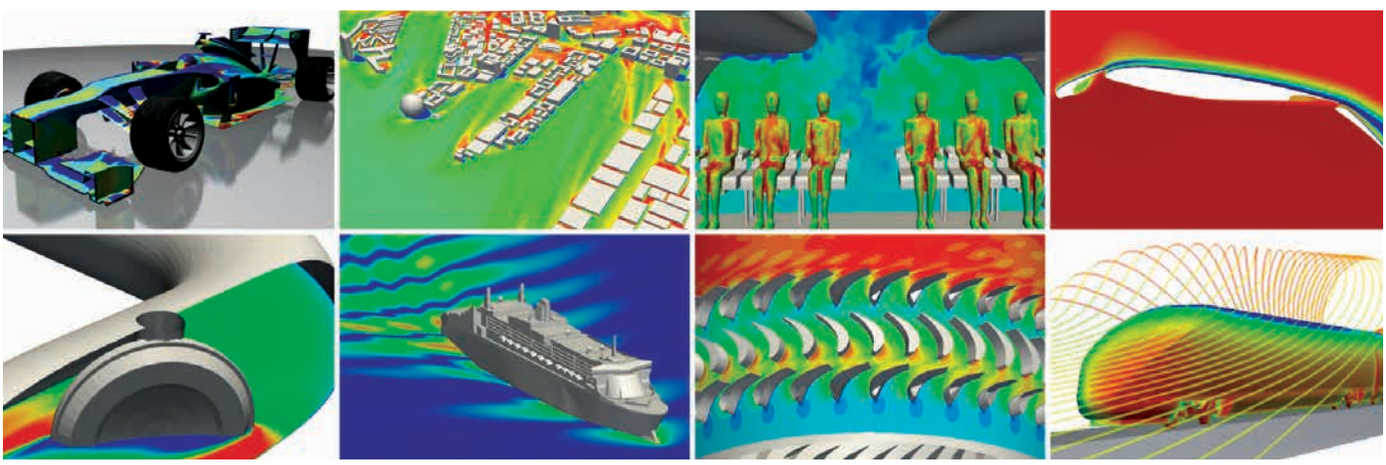

Image: ENGYS

A collaboration between EPCC and ENGYS has created a simulation-as-a-service (SAAS) business model offering cost effective, pay-per-use access to advanced CFD modelling.

ENGYS specialises in the development and provision of CFD software products and services. It has developed a general-purpose CFD software solution, HELYX, for engineering analysis and design optimisation based on an advanced open-source simulation engine created by ENGYS using the OpenFOAM libraries. HELYX combines the proven capabilities, support and reliability of commercial software with the inherent advantages of cost-effective, scalable open-source solutions.

The challenge

The inherent scalability of open-source CFD applications presents opportunities to benefit from using HELYX on high performance computing (HPC) platforms. But to realise these advantages, HELYX users need to access expensive HPC hardware.

How we helped

As this investment is beyond the means of many SMEs, ENGYS partnered with EPCC to provide access to a cloud-based software-as-a-service proposition offering customers access to advanced CFD modelling on an HPC cloud. A purpose-built, easy-to-use interface provides users with seamless migration from local desktops to Cirrus, giving economical access to the significant advantages of using a large-scale computing resource.

EPCC installed HELYX on the Cirrus HPC platform and collaborated with ENGYS to build a client-server type access model that offers users easy access to CFD capability enhanced by the power of high-performance computing. EPCC provide the required HPC hardware, storage and networking and manage all operating system, middleware and HELYX application software.

How does it work?

Access to Cirrus from a user's local workstation is seamless using the graphical user interface available with HELYX. The HPC software-as-a-service (SaaS) model offers users pay-per-use-access to the combined software and hardware service. Users gain the advantages of scale without costly investment in HPC hardware. Unlike many of its competitors, ENGYS facilitates access to HELYX 'at-scale' without the burden of overly expensive licensing terms.

For HELYX users the end result is easy, cost-effective access to HELYX on an HPC cloud, providing advantages in quicker engineering analysis, faster time to market and improved product design. HELYX users can focus on the problem at hand – advanced engineering analysis and design – without the burden of running HPC services.

EPCC investment in Cirrus, combined with EPCC's expertise, has enabled ENGYS to develop this new business model.

EPCC: the UK's leading supercomputing centre

Our Accelerator service: supercomputing on demand

Cirrus is just one part of our Accelerator service, which delivers high-performance computing capability at a fraction of the cost of buying and operating in-house HPC services.

Accelerator can be used as a:

- Transformative HPC resource accelerating development and discovery lifecycles
- Flexible HPC resource smoothing out demand peaks
- Contingency over internal HPC infrastructure failure

Accelerator provides access to:

- ARCHER: our high-end compute system for large-scale simulation and modelling challenges
- Cirrus: a midrange, industry-standard Linux cluster. An ideal platform for applying commercial software tools to solve a range of CFD and FEA simulation and modelling problems
- RDF: our large-scale data facility giving access to petabyte-scale data storage and archive facilities.

The World Class Data Infrastructure

The World Class Data Infrastructure (WCDI) will be a new facility managed by EPCC for the secure and trustworthy hosting and analysis of huge and varied datasets. Available to academia and industry, the WCDI will underpin the Data-Driven Innovation programme of the Edinburgh and South East Scotland City Region Deal.

We have been certified for the ISO 27001 Information Security standard for all the supercomputing and data services that we run, such as the NHS National Services Scotland national Safe Haven. A Safe Haven is a secure environment in which data is linked and accessed, providing a high-powered computing service, secure analytic environment, secure file transfer protocol for receipt of data, and provision of analytic software.

With our unique combination of facilities and skills, we aim to be a leader in the secure hosting and management of datasets for academia and industry.

With the security of our exceptional expertise

With over 100 highly-qualified permanent staff, we ensure you get the most from our systems.

We can help you with:

- General HPC support
- Training & consultancy
- Data management and analytics
- Software development
- Computational modelling & simulation

To discuss our services for business, contact George Graham at EPCC:
g.graham@epcc.ed.ac.uk +44 (0) 131 651 3460 +44 (0) 777 370 8191