

## Supersonic Simulations in the Cloud: Spike Aerospace Migrates All CFD to the Cloud

### Background and Challenge

Spike Aerospace is a fast-growing engineering firm developing the world's first supersonic business jet with Quiet Supersonic Flight technology. Spike runs hundreds of complex CFD simulations to understand the aerodynamic performance of their aircraft. CFD simulations are computationally intensive and traditionally require significant investment in on-premise infrastructure, tens of thousands of hours of runtime, expensive software license fees, and a team of hardware experts to optimize the HPC. The fixed capital costs for such compute- and time-intensive simulations would have been prohibitive under the traditional paradigm. To quickly get up to speed without investing in significant infrastructure, Spike Aerospace partnered with Rescale to migrate 100% of their CFD process to the cloud. As a result, they have realized massive cost and time savings.

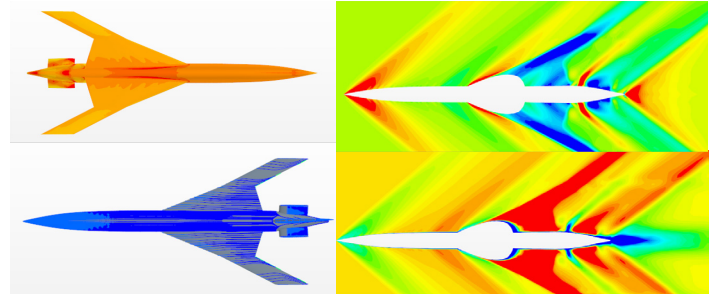


The Spike S-512 Supersonic Jet will fly from NYC to London in 3 hours

### The Rescale Solution

Spike Aerospace is a lean, agile, and innovative organization. Rescale's platform closely aligned with their needs and gave them a cost-effective, turn-key, and secure way to meet those demanding HPC needs.

On the Rescale platform, Spike used the natively-integrated STAR-CCM+ software and Rescale's Nickel hardware configuration on 64 cores to analyze the aerodynamics of the CD1 aircraft for various angles of attacks at cruising altitude conditions. The model had 32 million cells with a domain size of 1,000 million. The entire simulation process was conducted on Rescale's cloud, including CAD preparation and CFD domain creation, surface and volume grid preparation, setup and execution of HPC simulations, and post-processing.



### Results and Benefits

With the Rescale platform, Spike Aerospace was able to:

- Reduce capital expenditure on fixed infrastructure costs and expensive software licenses. With Rescale's pay-as-you-go scheme for server hardware and software licenses, they paid only for resources they actually used.
- Accelerate product time to market with instant, scalable access to HPC resources. Rescale's turn-key cloud solution enabled Spike to get up and running in weeks rather than months. Additionally, jobs never waited in queues or schedulers for HPC resources, and job runtimes dropped dramatically on Rescale's scalable hardware.
- Collaborate in real-time with team members around the world. Rescale's cloud-based platform allowed Spike's team to view and share all simulation files and results in real-time.
- Focus on design, trusting Rescale to protect their data with measures such as end-to-end data encryption and tight administrative controls.

**“By using Rescale’s cloud, our engineers were able to quickly and cost-effectively set up a HPC cluster to study the aerodynamic performance of various configurations and improve our designs.”**

Dr. Anutosh Moitra  
Chief Engineer, Spike Aerospace

## Spike Aerospace

Spike Aerospace is leading a global collaboration to develop the world's first supersonic business jet, the Spike S-512 Supersonic Jet. This advanced next-generation aircraft, with Quiet Supersonic Flight technology, will save travelers up to 50% flight time. A world-class team of senior engineers with backgrounds from leading aerospace companies are developing the high-level conceptual design of the supersonic aircraft. Top aerospace firms, like Maya, Siemens, Aernnova and Quartus Engineering are providing their expertise in aircraft design, engineering, manufacturing and testing. Flying Faster, Do More. <http://www.spikeaerospace.com>



## Rescale

Rescale is the world's leading cloud platform provider of simulation software and high performance computing (HPC) solutions. Rescale's platform solutions are deployed securely and seamlessly to enterprises via a web-based application environment powered by preeminent simulation software providers and backed by the largest commercially available HPC infrastructure. Headquartered in San Francisco, CA, Rescale's customers include global Fortune 500 companies in the aerospace, automotive, life sciences, marine, consumer products, and energy sectors. For more information on Rescale products and services, visit [www.rescale.com](http://www.rescale.com).



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