

SECTOR:
HI-TECH

OFFERINGS:
CUSTOM ENGINEERING
SOFTWARE

TECHNOLOGY:
FLUID DYNAMICS AND
SOFTWARE DEVELOPMENT

DEVELOPMENT OF CAE SOFTWARE ON GRID COMPUTING FRAMEWORK

Our customer is an esteemed research and development organization of working for development of high-performance computing platforms, HPC in short. The customer had established a new HPC facility that had a computing power amongst the best in India. Customer required a large practical application for testing the efficacy of the machine. Zeus Numerix was developing its finite volume time domain or FVTD based electromagnetics code. Zeus was tasked to generate a large test case and solve it on the HPC.

High frequency Radar Cross Section (RCS) simulations require generation of large mesh. A typical projectile geometry with known RCS data was chosen for simulation. A mesh of 4.2 billion cells was generated. Since the mesh size was 96GB specialized codes were developed to read the mesh in parallel. Simulation solver was optimized for the HPC architecture. Access to entire HPC was given and the large mesh size was solved in 11 Hours on a 2400 core machine. The result was validated using existing data and figure shows that the matching was excellent.

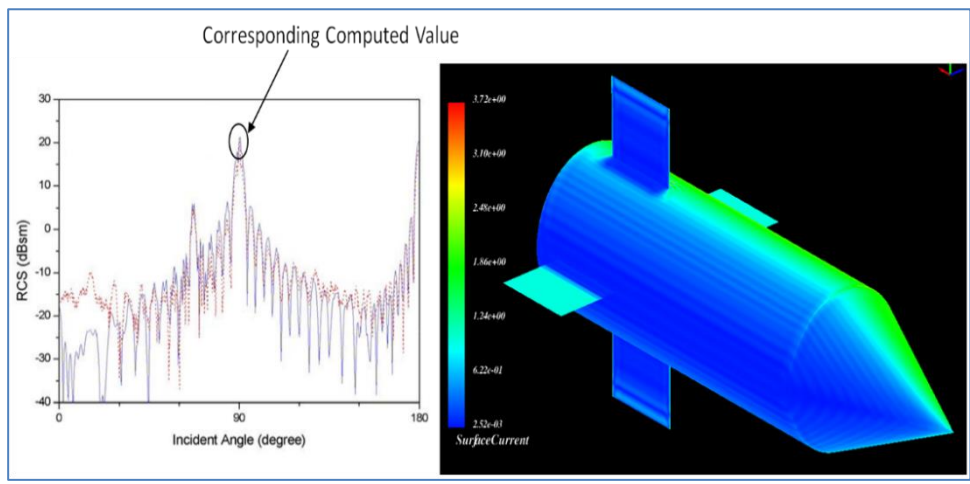
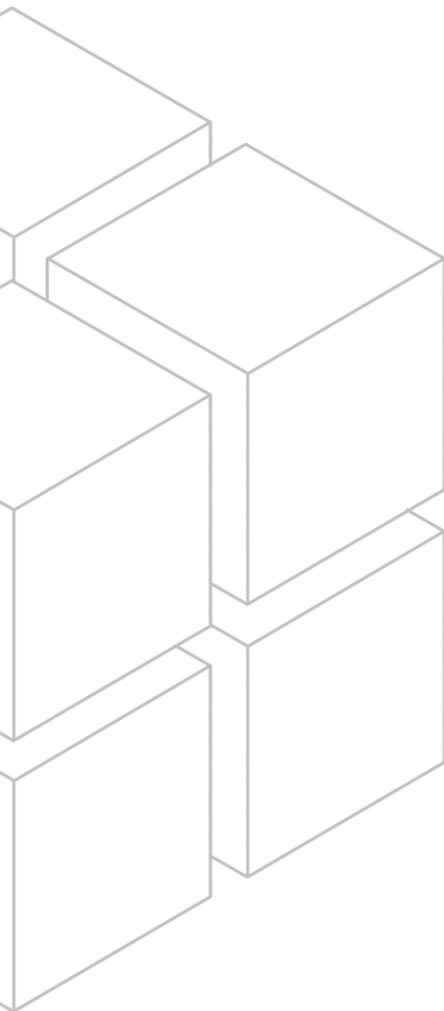


Figure 1: Missile RCS simulation solved using high-performance computing

A code with practical applications was run on the HPC and good scalability was obtained. The study proved the efficacy of the HPC for large problems and possibility of optimization on the architecture. The machine was connected and operated remotely, and this experiment was useful for sharing the machine with various researchers. The project demonstrated the capability of Zeus Numerix to use computing resources on cloud to product results.