



CASE STUDY /

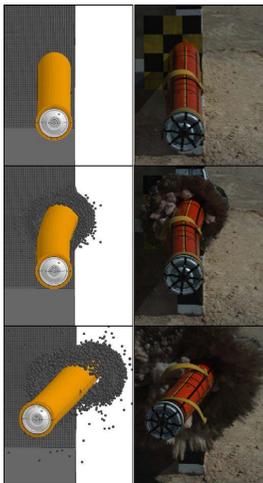
Ansys + ARA

“We started this [investigating turnkey HPC appliances for simulation environments] as things began shutting down because of COVID-19. We thought that would be a problem, but it turned out to go very smoothly. TotalCAE went out of their way to understand what we wanted and how we wanted it configured. When the appliance showed up, we had it mounted and running jobs the next day.”

Drew Malechuk
Lead Engineer / ARA

Applied Research Associates (ARA) reduced IT support costs and increased solver speeds by 20% with a managed high-performance computing appliance from TotalCAE.

The company's team in Albuquerque, N.M., focuses on design analysis, prototyping and testing of air-delivered weapons systems for the U.S. Air Force. The team relies on Ansys LS-DYNA for the bulk of its simulation work. Initially, they used personal workstations to perform simulations using one or two cores. However, this PC-based approach was not sufficient for the larger problems the group was asked to solve.



A warhead FEA model and test.

/ Challenges

ARA obtained a high-performance computing (HPC) cluster but struggled with maintaining it. IT staff had to dedicate several days per week to supporting the outdated hardware, and when there were failures, it could leave the engineering team idle while the IT staff would troubleshoot or try to find refurbished parts online.

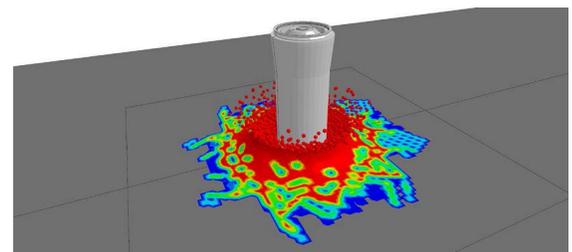
/ Engineering Solution

The ARA team made a requirements list for a new computing solution that would include high reliability, white-glove service, along with automatic updates and maintenance to help ensure the team was operating as efficiently as possible. ARA's contacts suggested they reach out to TotalCAE, a company that provides turnkey HPC appliances for simulation environments.

They explained their requirements to the TotalCAE team, and the appliance was installed in the data center in the summer of 2020. TotalCAE manages the appliance and CAE applications so that ARA personnel can focus on engineering instead of IT issues.

/ Technology Used

- Ansys LS-DYNA
- TotalCAE HPC cluster appliance



ARA can complete finite element analysis (FEA) for its defense clients more efficiently thanks to the managed HPC cluster appliance.

/ Benefits

The TotalCAE HPC appliance delivered improvements in both reliability and productivity. ARA is seeing 20% speed-up improvements in job compute times on the same number of cores. The new system has also helped with visualization. Previously, ARA purchased two visualization nodes from a different vendor but could never get them working correctly. With five high-end video cards in each node, it was an expensive lesson. Now, ARA has a high-end visualization node from TotalCAE that just works, and has helped improve post-processing.

/ Company Description

Applied Research Associates, Inc. (ARA) is globally recognized for applying technically-excellent, in-depth and diversified research, engineering and technical support services to provide answers to complex and challenging problems in the physical sciences. We approach every project as an opportunity to go beyond expectations by delivering mission-critical solutions that accomplish objectives and also lead to new possibilities.

The TotalCAE HPC cluster appliance installed at ARA includes powerful hardware and software elements to ensure optimal performance. Components include:

- Eight compute nodes with Intel® Xeon® Gold 6226R processors
- One visualization node
- One node for archival storage and one node for working storage
- TotalCAE Platform and managed services
- Ansys software

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