Ansys + NASCAR

Racing to Victory: NASCAR Meets an Aggressive Launch Schedule with Ansys Cloud

"In 2019, NASCAR began engineering a new Next Gen car design, with an ambitious goal of launching it in 2022. When the pandemic closed our physical facilities, we had to rely entirely on engineering simulation. Ansys LS-DYNA, supported by the flexible capacity of Ansys Cloud, enabled NASCAR to efficiently conduct many computationally intensive crash simulations. Not only did these cloud-hosted product studies accelerate our efforts and enable us to meet our launch date, but they also saved enormous costs by eliminating physical prototypes and crash tests. Without the combination of Ansys LS-DYNA and Ansys Cloud, I'm not sure the Next Gen car would have been ready for the 2022 season."

John Probst
Senior Vice President, Racing Innovation / NASCAR

NASCAR was on track to launch a revolutionary Next Gen car design that would change the face of stock car racing. Then the COVID-19 pandemic struck, eliminating the possibility of physical prototypes and tests. The NASCAR engineering team needed to verify the safety of its car design via numerically large Ansys LS-DYNA crash simulations — getting results in real time and iterating quickly. Ansys Cloud provided the solution. With best-in-class software deployed on the Microsoft Azure platform and running on Intel® Xeon®Platinum 8168 processors, NASCAR easily established a high-performing, cost- effective computing environment. This enabled the team to focus on its core competencies and launch its innovative Next Gen design on schedule.

/ CHALLENGES

As the leader in American stock car racing, NASCAR sets the pace for innovation. But in 2018, NASCAR executives realized they needed a complete redesign of the standard stock car chassis timprove relevancy, competition and safety. NASCAR's engineering team was on its way to meeting an aggressive launch date of 2022 when the global pandemic shut down its physical testing facilities. In LS-DYNA, NASCAR had the proven, purpose-built solution it needed to conduct thousands of crash tests of every type — including frontals, roof crashes, lateral side impacts, rear impacts, and oblique impacts. However, full-body crash simulations represent computationally large studies. Not only did the NASCAR engineering team need to run these simulations as quickly as possible, but they also had to iterate immediately, making rapid design changes and assessing a new set of trade-offs. Already on a tight schedule, NASCAR didn't have the time to configure, purchase, and install hardware. The team needed flexible computing capacity tomeet its day-to-day needs, which could change dramatically.

"While exciting, side-by-side racing is always the goal, driver safety is our top priority. As we developed the new Next Gen race car, we wanted to ensure we were making it as safe as possible. Using Ansys LS-DYNA in combination with Ansys Cloud, NASCAR has been able to run crash simulations at a fraction of the time and cost of real-life crash tests."

John Patalak
Managing Director of Safety Engineering / NASCAR

/ TECHNOLOGY USED

· Ansys Cloud
· Ansys LS-DYNA

/ ENGINEERING SOLUTION

Built on a robust Microsoft Azure platform, Cloud delivered the complete, on-demand cloud computing ecosystem NASCAR needed to quickly and seamlessly complete their crash simulations in LS-DYNA. The Ansys Customer Excellence (ACE) team also helped NASCAR specify a hardware solution — 44 Intel® Xeon®Platinum 8168 processor cores, with 8 GB of RAM per CPU core — that provided an optimized cost/performance ratio. This combination of Intel® for the hardware, Microsoft for the Azure platform, and Ansys for delivering the Cloud package created a single-source solution for NASCAR. As the Next Gen chassis design changed during the safety evaluation stage, Cloud ran new simulations quickly, enabling NASCAR engineers to see results, weigh tradeoffs, and move on to the next iteration. As day-to-day computing needs changed, Cloud accommodated that shifting capacity with no lags or downtime, keeping NASCAR's ambitious development schedule on track.

/ BENEFITS

Because Cloud is a preconfigured, all-in-one hardware and software solution, NASCAR could access best-of-breed technology without the need to invest in, install, and maintain its own computing resources, saving significant time and money. With the ability to run simulations in a robust, stable, and responsive cloud environment, NASCAR could minimize its reliance on physical prototypes and full-scale test crashes, which can exceed $500,000 per test. In fact, NASCAR was able to confidently launch its Next Gen car design on schedule by staging only two full scale physical test crashes for final design validation. By leveraging LS-DYNA on Cloud, NASCAR was able to save time and costs without sacrificing safety or analytic rigor while en route to a successful launch of the Next Gen car design in time for the 2022 racing season.

/ COMPANY DESCRIPTION

Founded in 1948, NASCAR (the National Association for Stock Car Racing) is the largest racing organization in the United States. With headquarters in Daytona Beach, Florida, the NASCAR organization provides a single set of requirements, rules, and design guidelines that are adopted by every racing team. Racing events managed by NASCAR draw millions of in-person attendees and television viewers around the world. Each year, NASCAR sanctions more than 1,500 races at over 100 tracks in 48 US states, as well as in Canada, Mexico, and Europe.

ANSYS, Inc.
Southpointe
2600 Ansys Drive
Canonsburg, PA 15317
U.S.A.
724.746.3304
ansysinfo@ansys.com

ansys.com