

PBS Professional at Trelleborg: An Automotive Design Group Maximizes Productivity



Key Highlights

Industry
Automotive

Challenge
To increase available CPU time.

Altair Solution
PBS Professional to harvest & manage CPU cycles on six workstations, increasing ROI.

- Benefits**
- Has helped win contracts by making the team more agile
 - Opens up CPU time to run theoretical jobs

Customer Profile

When you look for a new car, you probably think about style, comfort, performance, economy, or innovative electronics. You won't be thinking about the kinds of parts that Trelleborg Automotive makes. But they're there, all right, mostly unsung and out of sight, and you wouldn't want to be without them. Trelleborg, a Swedish corporation with a 100-year pedigree in engineering innovation, makes molded rubber components that damp down vibration and smooth out your ride. They cushion your engine where it meets the chassis. They buffer the mechanics of your steering column and suspension. Almost all of them do their jobs without ever seeing the light of day but if your floor gearshift lever has a rubber housing, that housing may have come from Trelleborg.

A team of designers and engineers at Trelleborg's Engineering Center in Michigan works closely with GM, Ford, Chrysler, Honda, Toyota, and other major auto makers to create custom polymer components designed to absorb vibration and impact and provide a more pleasing experience for new-car owners. This team has greatly improved its throughput, cost-efficiency, and turnaround time by putting PBS Professional® to work.

The Mission: Increase Throughput without Adding Bodies or Hardware

The Trelleborg design and finite element analysis (FEA) group is a small but very productive group with twelve workstations. No clusters running big assemblies; no cars crashing in cyberspace. Ten workstations

Trelleborg Success Story

“Maximizing our license utilization means we don’t have to buy a new license, set up another workstation, and hire another engineer to keep up with demand. That would cost us ten times what PBS Professional costs us.”

Russ Moerland,
FEA Engineer, Trelleborg

are used for CAD, turning out designs of brackets, bushings, and other chassis and power train components. On the other two workstations, engineers perform FEA analysis of these designs.

“We’re longtime users of Altair software,” says Design Manager Phil Boss. “We use Hyperworks for pre- and post-processing. We had reached a point on the FEA side where we didn’t have enough CPU time to handle the processing load. We had started sending out jobs. That’s when Altair suggested we begin looking at the business case for PBS Professional.”

Trelleborg’s FEA engineers were attempting to harvest off-hour CPU cycles from the CAD workstations on an ad hoc basis. With 15 tokens of Abaqus to work with,

they were able to run up to three jobs at a time after working hours. The problem was guessing how long each job would take on a given machine so that another job could be set up to run behind it.

“We could run around six or nine Abaqus jobs maximum per night,” says FEA engineer Russ Moerland. “Then the machines went idle because there was no way to queue them up. When we had a big project going at the end of the week with a lot of designs to run, and we needed results by Monday, I’d have to drive half an hour to work on a Sunday just to babysit a workstation.”

An Overwhelming Business Case

Trelleborg clearly needed a way to increase available CPU time. The team began crunching numbers. They estimated the

overall cost per hour of running meshed CAD designs in Abaqus on a typical workstation – which, in 2003, was \$75. Trelleborg then calculated the cost-effectiveness of using PBS Professional to harvest and manage CPU cycles on six workstations from 6:00 pm to 6:00 am daily and on weekends.

“I was skeptical about the business case for PBS Professional until I started running the numbers,” says Boss. “Then I thought, how can we not do this?” Boss conservatively estimated idle weekend hours per workstations at 60 hours. He reckoned that PBS Professional would pay for itself in just two weekends by making those idle CPU hours productive. That proved to be the case. After PBS Professional was installed, the team enjoyed an immediate surge in productivity. Instead of six jobs a night, they were soon



Trelleborg's Engineering Center

Trelleborg's Engineering Center has greatly improved its throughput, cost-efficiency, and turnaround time by putting PBS Professional to work. One major thrust of Trelleborg's work is to reduce the number, cost, and time of laboratory experiments and the ethical and safety problems associated with them.



averaging 10 or 20. They simply dumped jobs into the queue, and PBS Professional assigned them to the first available CPU.

"During the first full year we had PBS Professional," says Moerland, "two guys cranked out 450 CPU days of FEA just on nights and weekends. We're looking to beat that this year based on our current workload. With three Abaqus licenses, there are 90 CPU days available every month, and we're using 50 or 60 of them with PBS Professional. That means that PBS alone accounts for nearly 60 percent utilization of our licenses. Maximizing our license utilization means we don't have to buy a new license, set up another workstation, and hire another engineer to keep up with demand. That would cost us ten times what PBS Professional costs us."

Sharpening a Competitive Edge

Boss says that PBS Professional has helped Trelleborg win contracts by making the team more agile. They can see results more quickly, make alterations if necessary, and rerun multiple alternative designs overnight or over the weekend to maintain a tight turnaround. Even if a workstation crashes, PBS Professional automatically sends the next job to the first available CPU. This agility is in addition to the sheer throughput that PBS Professional makes possible.

"It's nice having PBS Professional manage our licenses so our jobs keep running and don't destroy a machine," says Boss.

"Let's say we generate a lot of work over a week. On Friday, we can stack that thing up with 30 or 40 jobs in the queue. When we come in Monday, we're looking at finished

jobs. A huge benefit. On an average weekend, we get 60 hours of work out of each machine — the equivalent of 1.5 engineers for a week."

"The other nice thing with PBS Professional is that it opens up CPU time to run theoretical jobs once in a while," says Moerland. "I run lots of production jobs. But I'm an engineer, and I get curious once in a while, and I want to ask, 'What if?'. The old way, we could only run 6-9 jobs on Friday. Now we can run 30 or 40, and we can ask a lot more questions."

"It's going every night and anytime someone's away from his desk or on vacation," says Boss. "The queue is full every weekend. I think we get maximum output from PBS Professional."

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About Altair

Altair empowers client innovation and decision-making through technology that optimizes the analysis, management and visualization of business and engineering information. Privately held with more than 1,800 employees, Altair has offices throughout North America, South America, Europe and Asia/Pacific. With a 27-year-plus track record for high-end software and consulting services for engineering, computing and enterprise analytics, Altair consistently delivers a competitive advantage to customers in a broad range of industries. Altair has more than 3,000 corporate clients representing the automotive, aerospace, government and defense, and consumer products verticals. Altair also has a growing client presence in the electronics, architecture engineering and construction, and energy markets.

About PBS Works

PBS Works™, Altair's suite of on-demand cloud computing technologies, allows enterprises to maximize ROI on existing infrastructure assets. PBS Works is the most widely implemented software environment for managing grid, cloud, and cluster computing resources worldwide. The suite's flagship product, PBS Professional®, allows enterprises to easily share distributed computing resources across geographic boundaries. With additional tools for portal-based submission, analytics, and data management, the PBS Works suite is a comprehensive solution for optimizing HPC environments. Leveraging a revolutionary "pay-for-use" unit-based business model, PBS Works delivers increased value and flexibility over conventional software-licensing models.

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