

## PBS Professional at TRW Automotive: A Standard Solution for European Design Centers



**Industry**  
Automotive

**Challenge**  
Computing environment to decide which hardware resource to use for maximum efficiency.

**Altair Solution**  
A flexible solution that takes care of loading the system on whatever resources are available.

- Benefits**
- Keeps clusters running efficiently & ensures maximum utilization
  - Access to the code allows user to configure it the way they want

### Customer Profile

As a global technology company, TRW Automotive touches most of us in ways we're unaware of. And when we drive, it is practically a certainty that a TRW system with brakes, airbags, seat belts, or steering is part of the experience. A Tier One automotive industry supplier with a focus on safety products, TRW Automotive works with almost any car and truckmaker you can name, worldwide.

### Challenge: Increase Compute Power and Workflow

In Europe, safety systems are designed at several TRW Automotive engineering centers. In 2005, the Chassis group took a hard look at the company's European

CAE requirements and its existing compute platforms. Its CAE engineers had been working exclusively on desktop workstations. The group wanted more compute power and a smoother workflow.

"We wanted a flexible and standardized solution," says European CAE Manager Steering & Suspension Dirk Vieker of TRW Tech Center Duesseldorf. "The European sites work closely together and we wanted a better way to collaborate. We wanted our CAE engineers to be able to concentrate on their work and let the computing environment decide which hardware resource to use for greatest efficiency. And above all, we wanted assurance that the money we were spending would be used in the most efficient and

# TRW Automotive Success Story

**“We can load the system with a huge number of jobs, and PBS Professional takes care of loading the system on whatever resources are available. We are quite happy to have this powerful, efficient environment.”**

**Dirk Vieker,**

European CAE Manager Steering & Suspension, TRW Tech Center Duesseldorf

intelligent way.” PBS Professional® workload management software helped to assure that the new solution filled those requirements.

## **The Solution: A Common CAE Environment**

The Chassis group preferred not to commit its limited internal IT resources to the development of a new CAE computing infrastructure. Instead, they asked GNS Systems, a systems integrator recommended by Altair Engineering, to develop a standard CAE solution for the four engineering sites. GNS was commissioned with providing the complete solution, including design, purchasing, installation, implementation, and ongoing post-installation support.

With ease of use, utilization of processors, and ROI in mind, the group looked at three workload management systems for potential

use on its new HPC clusters: LSF, Sun GridEngine, and PBS Professional.

“We looked at everything – prices, pros and cons,” says Vieker. “In the end we saw that PBS Professional gave us the best functionality and capabilities and a very good price. It also gives us access to the code, so we can configure it the way we want. “We already had a good relationship with Altair, and in fact we have a global software contract with them. It’s important to us to work with a partner we know we can trust. GNS also gave us very good feedback about PBS Professional support.”

By the end of 2005, GNS Systems had installed Linux-based, Intel-driven PC clusters within several engineering sites and configured PBS Professional on all systems. The same technology will soon be installed

in one Eastern European Site. Standardization will save TRW administration costs and simplify purchases, changes, upgrades, and collaboration between engineering sites.

## **The Benefits: Transparency for TRW Engineers**

For the group’s engineers, the leap in processing power from a desktop workstation to an HPC cluster represents a huge improvement in CAE turnaround time compared to desktop workstations. PBS Professional is the oil that keeps the clusters running efficiently and ensures maximum utilization.

“My impression after the first six weeks of operation is that PBS Professional is clearly running very well indeed,” says Vieker. “I’ve been getting very good feedback about the functionality of this software from our CAE

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engineers here at Duesseldorf and at the other sites. And yet we don't see it. We just put a job in the PBS Professional queue, and it manages the job totally – which nodes it's sent to, and which queue it will run in most efficiently.

"We have about 20 users at the various sites, and they all use the major CAE codes. Some of them were a little suspicious about handing control of their jobs to PBS Professional, but they're all happy with it now. They simply go to a web interface, bring up their inputs, select the code they want, and click to submit the job to PBS Professional. At that point they are totally decoupled from all the old administration stuff, the shell script work in UNIX, and additional file handling. It's very efficient for us.

"And when I look at the utilization of the hardware, I see that it's very balanced. I don't see one node highly loaded

and people waiting for their jobs. PBS Professional workload management is working very, very well."

### **Looking Ahead: Adoption by Other TRW Groups**

The success of PBS Professional in the Chassis group's new CAE infrastructure has not gone unnoticed by other groups within TRW Automotive. A number of engineering teams, including groups that have been using open-source products, have asked about the performance of PBS Professional in CAE environments.

"I expect some other engineering sites to step forward to PBS Professional," says Vieker. "I think there's a good chance that PBS Professional workload management could become a standard in the TRW Automotive CAE community." There has been similar interest in the Chassis group's

use of standard hardware components. Vieker sees more opportunities ahead to increase productivity with PBS Professional. Each engineer uses a dual-processor workstation as a front end to the cluster, and these processors will probably become PBS Professional clients in the near future, adding CPUs to the power of the clusters. TRW has also considered the possibility of using a high-speed WAN to set up grid computing among various CAE sites. At present, however, the systems are meeting the group's needs for productivity and faster turnaround.

"We're getting our results back much more quickly because of the bigger system," says Vieker. "We can load the system with a huge number of jobs and get a good response. PBS Professional takes care of loading the system on whatever resources are available. "We are quite happy to have this powerful, efficient environment."

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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.

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## 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.

[www.pbsworks.com](http://www.pbsworks.com)



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