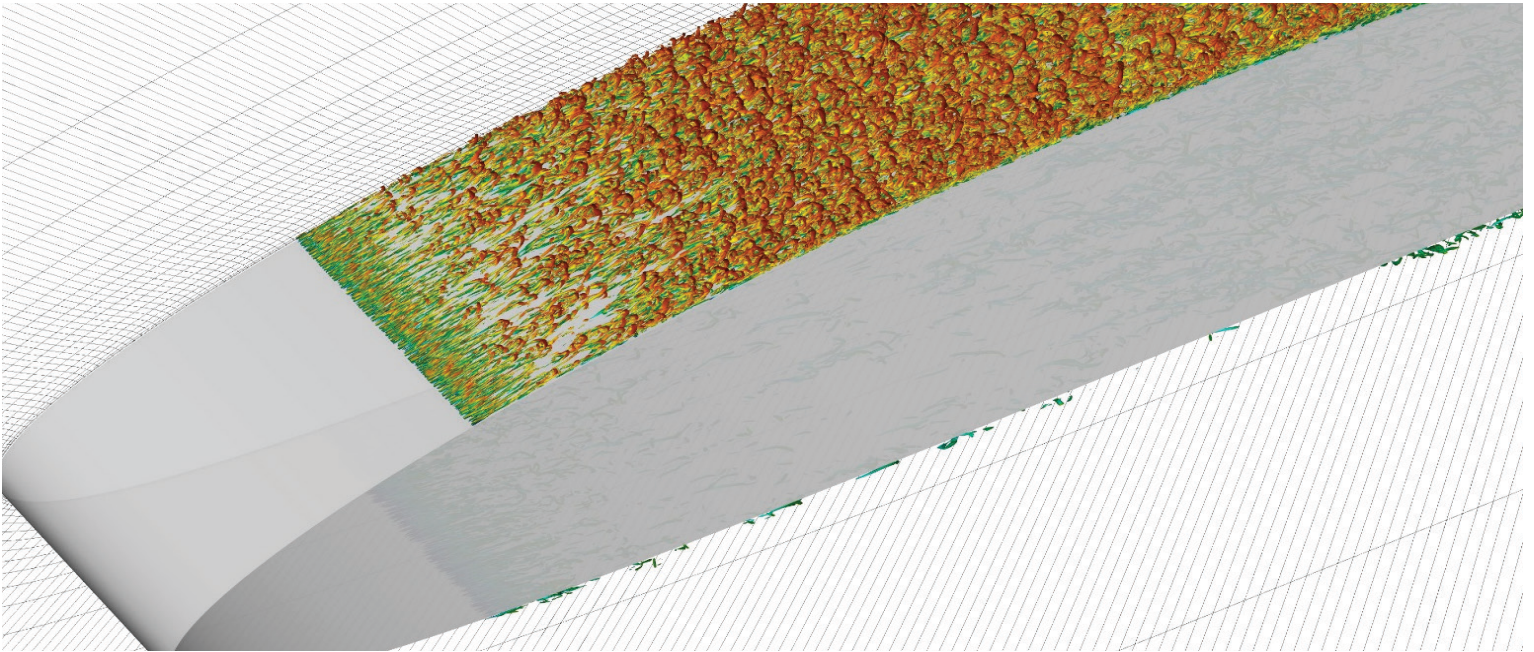**CASE STUDY** KTH wins from crystal clear insight into application performance with Arm Performance Reports

arm PERFORMANCE REPORTS

PDC Center for High Performance Computing

Arm Performance Reports delivers rapid return on investment by helping to transform throughput at the KTH Royal Institute of Technology in Sweden.

SITUATION
KTH provides the largest HPC resource for Sweden's research community.

PROBLEM
With many users and applications, compute cycles are in high demand.

CHALLENGE
Identifying the applications that have performance problems quickly.

SOLUTION
Arm Performance Reports answers vital questions about applications with minimal effort.

RESULTS
Performance problems are identified faster and throughput has increased.

After less than a month of use, Erwin Laure, director of the PDC Center for High-Performance Computing at the KTH Royal Institute of Technology in Sweden, can see the benefits – both in time and effort – of using Arm Performance Reports.

Laure began using Arm Performance Reports in April 2014. "And it's exactly what we wanted – simple and non-intrusive, and quickly identifying potentially problematic applications," he says.

IDENTIFYING ISSUES QUICKLY

Radovan Bast, an application expert for quantum- and computational-chemistry who has been evaluating the tool, agrees. "It gives a quick overview and points me in the right direction. Then, once I know what the problem is, I can go in and resolve the issue."

Laure runs the PDC Center for High-Performance Computing in Stockholm, Sweden, providing leading HPC services to Swedish academia as part of the Swedish National Infrastructure for Computing (SNIC), and internationally via the PRACE (Partnership for Advanced Computing in Europe) infrastructure.

After seeing Arm Performance Reports demonstrated at SC13 in Denver, Colorado in November 2013, Laure decided to test it

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Beskow - The Cray XC40 at the PDC Centre for HPC, KTH

out. It is now running on three clusters – one Cray cluster for larger jobs and two smaller Linux clusters. Usage had been reaching 95% over 36,000 cores, and it was vital to identify bad performers and resolve issues.

A SIMPLE, SYSTEMATIC WAY TO IMPROVE PERFORMANCE

Arm Performance Reports provides a simple report that tells the user how well optimized an application is for the system it is running on, what could be improved, and how it could benefit from running at scale. I/O or networking bottlenecks are instantly identified, and suggestions given on software and configuration changes that will improve performance.

"Before using Performance Reports, we basically looked at applications in a non-systematic way, trying to spot the ones that use most resources, the ones with strange behaviours," he says.

"Now, we just run Performance Reports, identify the problems and then allocate the time and resources that we need."

A TOOL EVERYONE CAN USE

"We are also introducing it to our users. We need to really advertise it and work with the users to show them how it can help them – it isn't just for us here in the computer centre. I'm already working on step-by-step documentation to help them to use it.

"We do have application experts in-house, and so the ideal situation is if the users use the software together with an expert who will guide them through it – but they can use it on their own if they prefer," he says.

IMPROVED EFFICIENCY MEANS MORE RESULTS

In the long term, Arm Performance Reports will

Dr. Erwin Laure, Director, PDC KTH

help Laure's users to get more research done from the resource available.

"If we make sure our resources are used more efficiently, we can support more users. There will always be demand and there will always be a shortage of resource for all the science that could be done or should be done – it's ever expanding. But it makes sense to be as efficient as we can be, and to identify and improve poorly performing applications."

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