HPC08a

Improving Cluster Production with Allinea's Tools

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SUMMARY

Today science and engineering projects continue to gain tremendous value from the parallel capability offered by new and existing hardware architectures. However, maintaining this trend whilst in tandem keeping energy consumption low is a technological challenge - especially when it comes to applications. During this technical session, Allinea will demonstrate how the expansion of our product portfolio is enabling our customers in the Oil & Gas market to address these challenges head on. Today, Allinea is the leading company in the development of empowering, informative and intuitive software tools designed to help you maximize the value of your HPC investments.

Introduction

Today science and engineering projects continue to gain tremendous value from the parallel capability offered by new and existing hardware architectures. However, maintaining this trend whilst in tandem keeping energy consumption low is a technological challenge - especially when it comes to applications.

The expansion of Allinea product portfolio is enabling users in the Oil & Gas market to address these challenges head on. Today, Allinea is the leading company in the development of empowering, informative and intuitive software tools designed to help you maximize the value of your HPC investments.

Allinea Forge : The Industry Standard HPC C++ and F90 Development Suite

Allinea Software provides a unified development environment for high performance computing which combines two leading tools into a single consistent solution for application developers. Allinea Forge includes:

- Allinea DDT – the scalable and intuitive parallel debugger
- Allinea MAP – the scalable low-overhead parallel performance profiler

The **Key Benefits** are:

- **One interface** drives both debugging and profiling: a unique product combination enabling
 - **Faster development than ever before:** flick from profiling to debugging in one click and address challenges as they appear in your workflow
 - **A faster learning curve:** one single interface ensures that less time is needed to learn the products, making users productive sooner
 - **Higher adoption of tools and professional software development practices:** development capabilities are all to hand - users don't need to change tool depending on what they want to achieve
- **Ease-of-use:** The **modern graphical interface** is designed for both scientists and software engineers alike.
 - **Focus on the information that matters:** our GUI provides the information the user really needs
- **Robust, scalable, proven:** The shared scalable architecture is proven beyond Petascale for both Allinea MAP and Allinea DDT.
 - **Simplifying Complexity:** Smart data consolidation techniques sort, filter and merge the vast datasets and state information to present readable, relevant and actionable information
 - **Unrivalled comfort:** the GUI remains quick and responsive, whatever the scale, wherever the user is, thanks to the Allinea native remote client and advanced architecture
- **Easier administration:** one single package includes everything for lightning fast installation and configuration.

Allinea Performance Reports: Application Analytics for HPC Clusters

HPC systems are valuable resources and it is vital to ensure that they are being used well. In order to do so, tools are necessary to understand applications' behavior and to determine whether they are making the best use of the system or not.

Allinea Performance Reports are designed to help address this challenge. They fully benchmark the applications running on HPC systems to measure their performance and also provide the clear tuning guidance needed to improve them.

Allinea Performance Reports work without instrumenting or recompiling applications – so they can be applied to the applications that matter, instantly – and help a wide range of technical people and scientists focus their efforts.

It shares the same architecture and graphical interface as Allinea DDT, and uses highly scalable per-process performance sampling. Without the need for instrumentation, Allinea MAP records important performance data which is then processed and presented to the user.

With Allinea Performance Reports, it is now possible to:

- **Save time identifying the applications making inefficient use of system resources**
 - Wrap applications within Allinea Performance Reports immediately with no effort
 - Run one single benchmark (instead of many) to retrieve all the metrics that matter: CPU, memory, IOs, MPI, threads, accelerators... and even energy with the Allinea Energy Pack!
- **Tune production applications** to make better use of the cluster
 - Bottlenecks and areas for improvement are clearly highlighted in the reports
- **Rapidly deploy new systems** with guided tuning of key applications
 - Compare reports on multiple machines and certify applications on your new systems quicker
 - Identify possible faults by looking at the application analysis and resolve infrastructure problems more easily
- **Pinpoint the impact of system configuration** on performance
 - Ensure that clusters remain modern without impacting on production
- **Choose the right hardware** for the applications you run
 - Portability and migration of applications is made easier with Allinea Performance Reports - a portable and professional benchmarking tool
- **Reduce support costs** by triaging performance bottlenecks faster
 - Automate application analysis to easily set priorities and focus on the biggest issues first
- **Detect hardware faults and network topology issues** that affect application performance
 - Immediately identify jobs that have a drastically different behavior and investigate root causes knowingly
- **Improve system efficiency by creating performance awareness within your users**
 - A deep and professional benchmarking tool is now accessible to everyone - juniors and experts alike.