

Score-P and Scalasca Performance Tools Training

<http://www.nersc.gov/users/training/events/scorep-and-scalasca>

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Agenda

Time	Topic	Presenter
09:00	Welcome	Yang
09:10	Introduction to VI-HPS & overview of tools	Feld
	Introduction to parallel performance engineering	
	Building and running NPB-MZ-MPI/BT-MZ on Cori	
	Instrumentation & measurement with Score-P	
11:00	<i>Coffee break</i>	
11:15	Profile analysis report exploration with Cube	Böhme
	Configuring & customizing Score-P measurements	Feld
	Automated trace analysis with Scalasca	Böhme
13:00	<i>Lunch</i>	
14:00	Hands-on coaching to apply tools to your own codes	all
17:00	<i>Adjourn</i>	

Virtual Institute – High Productivity Supercomputing

- **Goal:** Improve the quality and accelerate the development process of complex simulation codes running on highly-parallel computer systems
- Start-up funding (2006–2011) by Helmholtz Association of German Research Centres
- Activities
 - Development and integration of HPC programming tools
 - Correctness checking & performance analysis
 - Academic workshops
 - Training workshops
 - Service
 - Support email lists
 - Application engagement

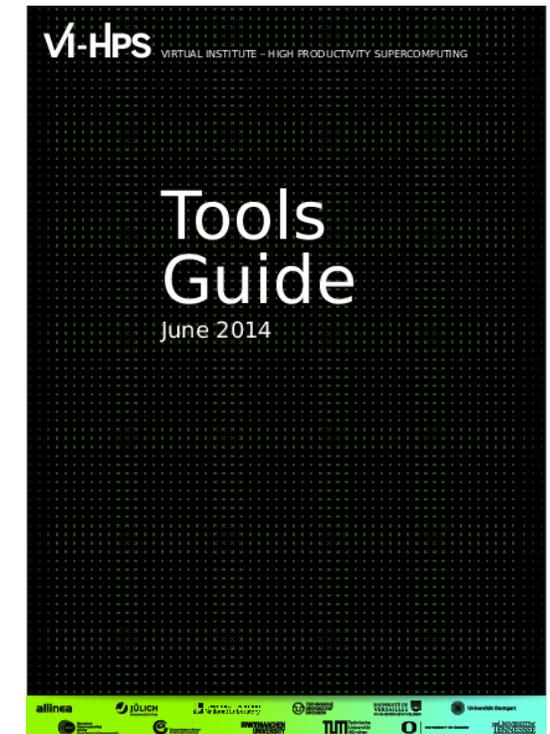


<http://www.vi-hps.org>

Productivity tools

- **MUST & Archer**
 - MPI & OpenMP usage correctness checking
- **PAPI**
 - Interfacing to hardware performance counters
- **Periscope Tuning Framework**
 - Automatic analysis and Tuning
- **Scalasca**
 - Large-scale parallel performance analysis
- **TAU**
 - Integrated parallel performance system
- **Vampir**
 - Interactive graphical trace visualization & analysis
- **Score-P**
 - Community-developed instrumentation & measurement infrastructure

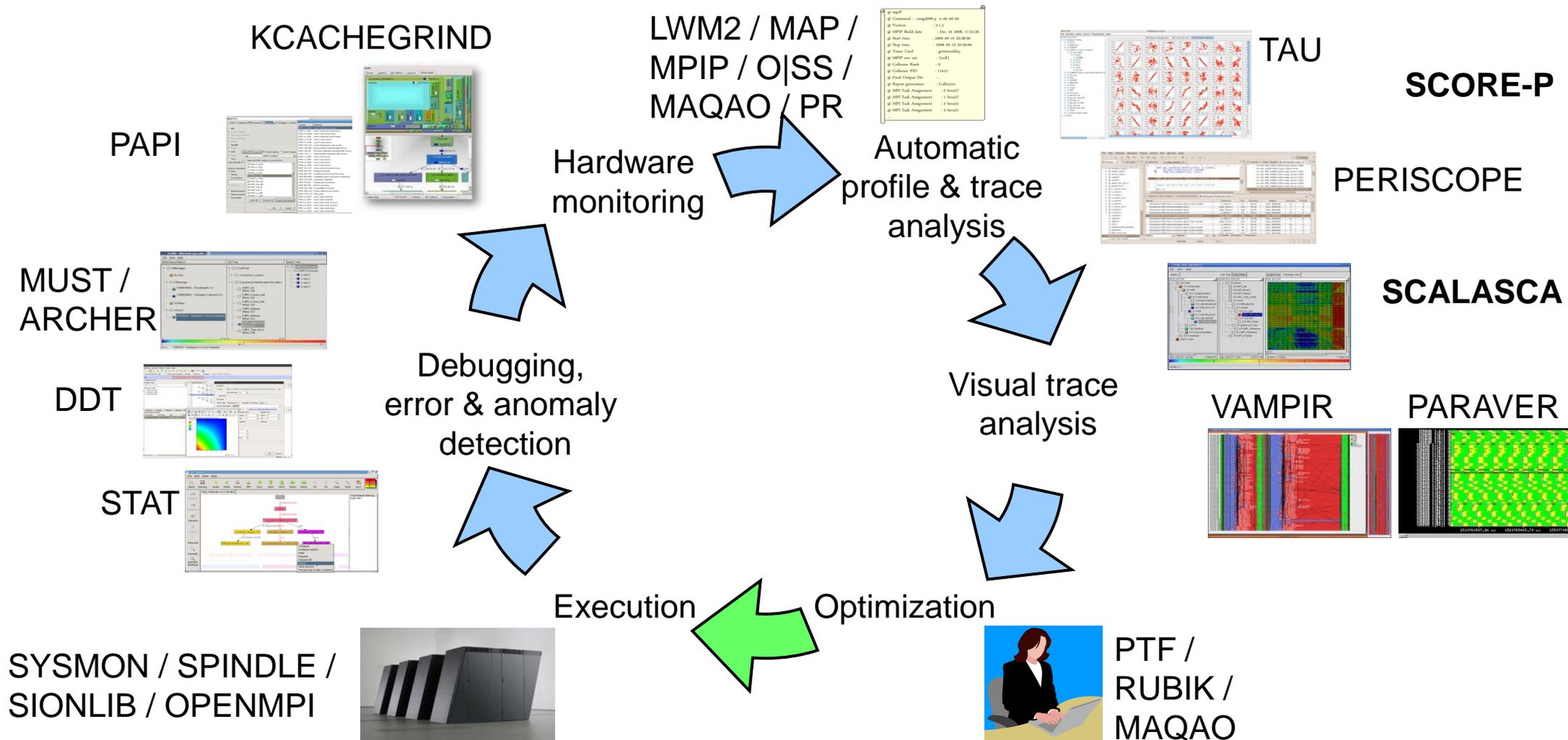
For a brief overview of tools consult the VI-HPS Tools Guide:



Productivity tools (cont.)

- [DDT/MAP/PR](#): Parallel debugging, profiling & performance reports
- [Extra-P](#): Automated performance modelling
- [Kcachegrind](#): Callgraph-based cache analysis [x86 only]
- [MAQAO](#): Assembly instrumentation & optimization [x86-64 only]
- [mpiP/mpiPview](#): MPI profiling tool and analysis viewer
- [Open MPI](#): Integrated memory checking
- [Open|SpeedShop](#): Integrated parallel performance analysis environment
- [Paraver/Dimemas/Extrae](#): Event tracing and graphical trace visualization & analysis
- [Rubik](#): Process mapping generation & optimization [BG only]
- [SIONlib/Spindle](#): Optimized native parallel file I/O & shared library loading
- [STAT](#): Stack trace analysis tools
- [SysMon](#): Batch system monitor plugin for Eclipse PTP

Technologies and their integration



Disclaimer

Tools will ***not*** automatically make you, your applications or computer systems more productive.

However, they can help you understand ***how*** your parallel code executes and ***when / where*** it's necessary to work on correctness and performance issues.

VI-HPS training & Tuning Workshops

- Goals
 - Give an overview of the programming tools suite
 - Explain the functionality of individual tools
 - Teach how to use the tools effectively
 - Offer hands-on experience and expert assistance using tools
 - Receive feedback from users to guide future development
- For best results, bring & analyze/tune your own code(s)!

- VI-HPS Hands-on Tutorial series
 - SC'08/09/10/11/13/14/15/16, ICCS'09, Cluster'10, EuroMPI'12/14, XSEDE'13, ISC-HPC'15/16
- VI-HPS Tuning Workshop series
 - 2008 (Aachen & Dresden), 2009 (Jülich & Bremen), 2010 (Garching & Amsterdam), 2011 (Stuttgart & Aachen), 2012 (St-Quentin & Garching), 2013 (Saclay & Jülich)
 - 2014 (Barcelona, Kobe, Saclay, Edinburgh)
 - 2015 (Stuttgart, Grenoble & Santiago),
 - 2016 (Kobe, Garching, Cambridge)

Performance Audits/Plans/Proof-of-concepts

- Performance Optimization and Productivity (POP)
 - Offers performance optimization and productivity services
 - Time-limited offer/project
 - Using VI-HPS tools
 - Funded by European Unions Horizon 2020 research and innovation program
 - <https://pop-coe.eu/services>
 - The services are **free of charge to organizations in the EU!**

