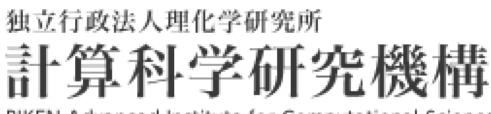
#### Virtual Institute – High Productivity Supercomputing







RIKEN Advanced Institute for Computational Science



## 14th VI-HPS Tuning Workshop RIKEN AICS, Kobe, Japan 25-27 March 2014



- Presenters
  - Jens Domke (Tokyo Institute of Technology)
  - Monika Lücke (German Research School for Sim. Sciences)
  - Judit Giménez (Barcelona Supercomputing Centre)
  - Brian Wylie (Jülich Supercomputing Centre)
- Thanks
  - Local organisation: Tomotake Nakamura, Itaru Kitayama
  - Hosts: RIKEN AICS
  - Sponsors:



14th VI-HPS Tuning Workshop (25-27 March 2014) RIKEN AICS

#### Outline



#### **Tuesday 25th March**

- 09:00-10:30 Welcome & Introduction
  - Introduction to VI-HPS & overview of tools
  - Introduction to parallel performance engineering
  - Lab setup for hands-on exercises with BT-MZ
- **11:00-12:30** 
  - ► Instrumentation & measurement with Score-P
  - Execution profile analysis report examination with CUBE
- **13:30-15:00** 
  - Configuration & customisation of Score-P measurements
- **15:30-17:00** 
  - Automated trace analysis with Scalasca
  - ► Interactive trace analysis with *Vampir*
- 17:00-17:30 Review of day and schedule for workshop

14th VI-HPS Tuning Workshop (25-27 March 2014) RIKEN AICS

VI-HPS

Schedule to be determined!

#### Wednesday 26 March

- 09:00-17:00 *TBD*
- 16:00-16:30 Visit to *K* computer
- 17:00-17:30 Review

#### Thursday 27 March

- 09:00-17:30 *TBD*
- 17:00-17:30 Review of workshop

#### Friday 28th March

Additional discussions (TBD)

 On-demand presentations and discussions on topics of interest

 Hands-on coaching to apply tools to analyse & tune your own codes on FX10 and *K* computer

- We'd like to know a little about you, your application(s), and your expectations and desires from this tutorial
- What programming paradigms do you use in your app(s)?
  - only MPI, only OpenMP, mixed-mode/hybrid OpenMP/MPI, ...
  - Fortran, C, C++, multi-language, ...
- What platforms/systems *must* your app(s) run well on?
  - Fujitsu FX10/K, Cray, IBM BlueGene, Linux cluster™, ...
- Who's already familiar with *serial* performance analysis?
  - Which tools have you used?
    - ► time, print/printf, prof/gprof, VTune, ...
- Who's already familiar with *parallel* performance analysis?
  - Which tools have you used?
    - ► time, print/printf, prof/gprof, Fujitsu tools, Scalasca, Vampir, ...

• Ensure your application codes build and run to completion with appropriate datasets

- initial configuration should ideally run in less than 10 minutes with 1-4 compute nodes
  - ► to facilitate rapid turnaround and quick experimentation
- larger/longer scalability configurations are also interesting
  - turnaround may be limited due to busyness of batch queues
- Compare your application performance on other systems
  - VI-HPS tools already installed on a number of HPC systems
    - if not, ask your system administrator to install them (or install a personal copy yourself)



## 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.

# DON'T PANIC!

### The workshop presenters are here to assist you.

NB: On the assumption that nothing terrible is going to happen and everything's suddenly going to be alright really, all advice may be safely ignored.

14th VI-HPS Tuning Workshop (25-27 March 2014) RIKEN AICS

#### Workshop system (hardware)

<b>System</b> Domain	<b>pi</b> ircpi.kobe-u.ac.jp	<b>fx10</b> aics.riken.jp	<b>k</b> aics.riken.jp
Model 6D Tofu network	Fujitsu FX10 1x1x17x2x3x2	Fujitsu FX10 1x1x17x2x3x2	<i>K</i> computer 24x18x17x2x3x2
<b>Processors</b> Frequency	SPARC64 IXfx 1.848 GHz	SPARC64 IXfx 1.848 GHz	SPARC64 VIIfx 2.0 GHz
Compute nodes	192	192	82,944
Chips per node	1	1	1
Cores per chip	16	16	8
Threads per core	1	1	1
Memory per node	32 GB	32 GB	16 GB

**System** fx10 k pi ircpi.kobe-u.ac.jp aics.riken.jp domain aics.riken.jp Filesystem FEFS **FEFS FEFS** Parallel filesys /data /data /data [/work] Fujitsu 1.2.1 Compiler Fujitsu 1.2.1 Fujitsu 1.2.0-15 **OpenMP** flag -Kopenmp -Kopenmp -Kopenmp MPI Fujitsu MPI 2.1 Fujitsu MPI 2.1 Fujitsu MPI 2.1 C compiler mpifccpx mpifccpx mpifccpx C++ compiler mpiFCCpx mpiFCCpx mpiFCCpx Fortran compiler mpifrtpx mpifrtpx mpifrtpx Queuing Parallelnavi Job Operation Software job submit pjsub job.sh pjsub job.sh pjsub job.sh list jobs pjstat pistat pjstat