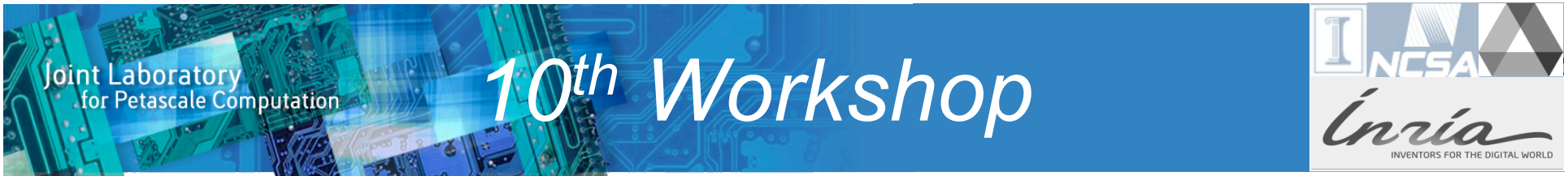
10th Workshop of the
INRIA-Illinois-ANL
Joint Laboratory for PetaScale Computing

November 25-27 2013

NCSA, Urbana, IL

Joint Laboratory for Petascale Computation

10th Workshop

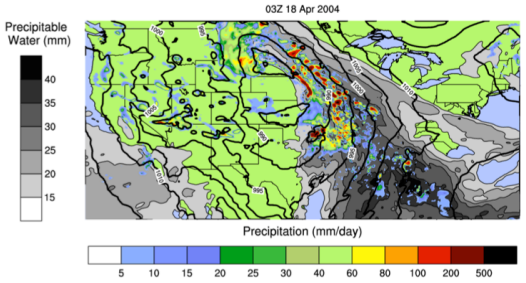


First Workshop of the
INRIA-Illinois Joint Laboratory
on PetaScale Computing

Franck Cappello

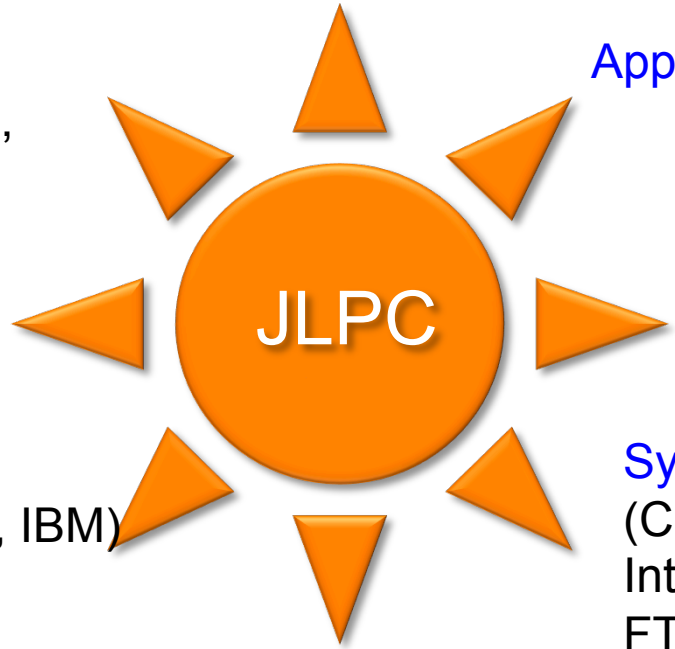
INRIA-Illinois-ANL Eco system

Applications:
-Contagion on very large social networks
-Earthquake system science
-Formation of the first galaxies
ETC.



Users (Center for Atmospheric research, etc.)

Application developers



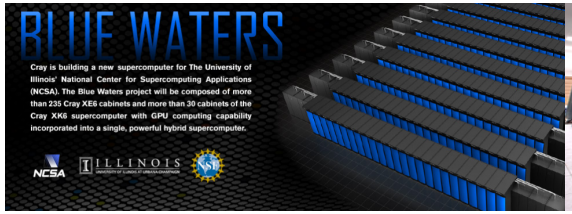
Algorithm research and development (Numerical methods, Mapping + load balancing, FT, I/O)

System practitioners.

System software R&D (Charm++, HDF5, MPICH, Integrated System Consol, FTI, etc.)

Hardware vendor (CRAY, IBM)

HPC System



Mira

Joint-Lab Areas of Collaboration

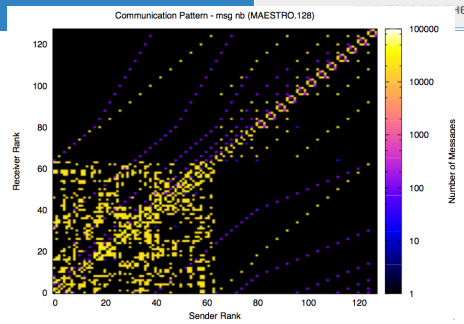
- ***Numerical Algorithms and Libraries*** (Communication avoiding, dynamic scheduling, linear algebra, adjoin methods, etc.);

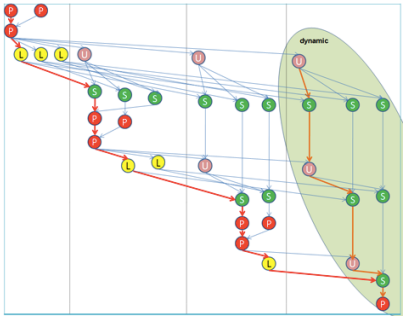
- ***Programming and runtime*** (parallel languages, runtime, multi-threading, process mapping, scheduling, communication libraries, etc.)

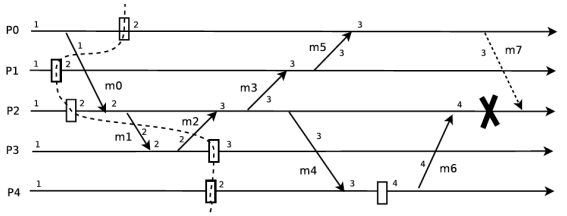
- ***Resilience*** (FT-protocols, event log analysis, multi-level checkpointing, resilience performance modeling, energy consumption, etc.);

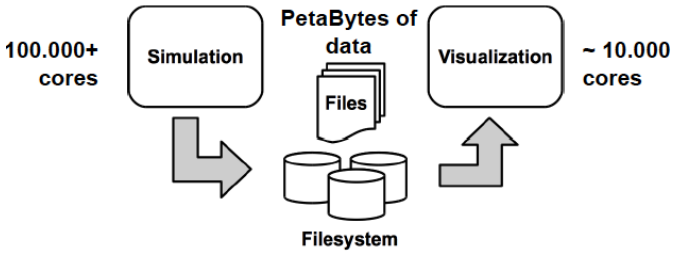
- ***System software*** (monitoring, resource-job manager, I/O & file systems, visualization, etc.).

- ***Cloud*** (HPC Cloud, Fault tolerance, testbed, etc.)





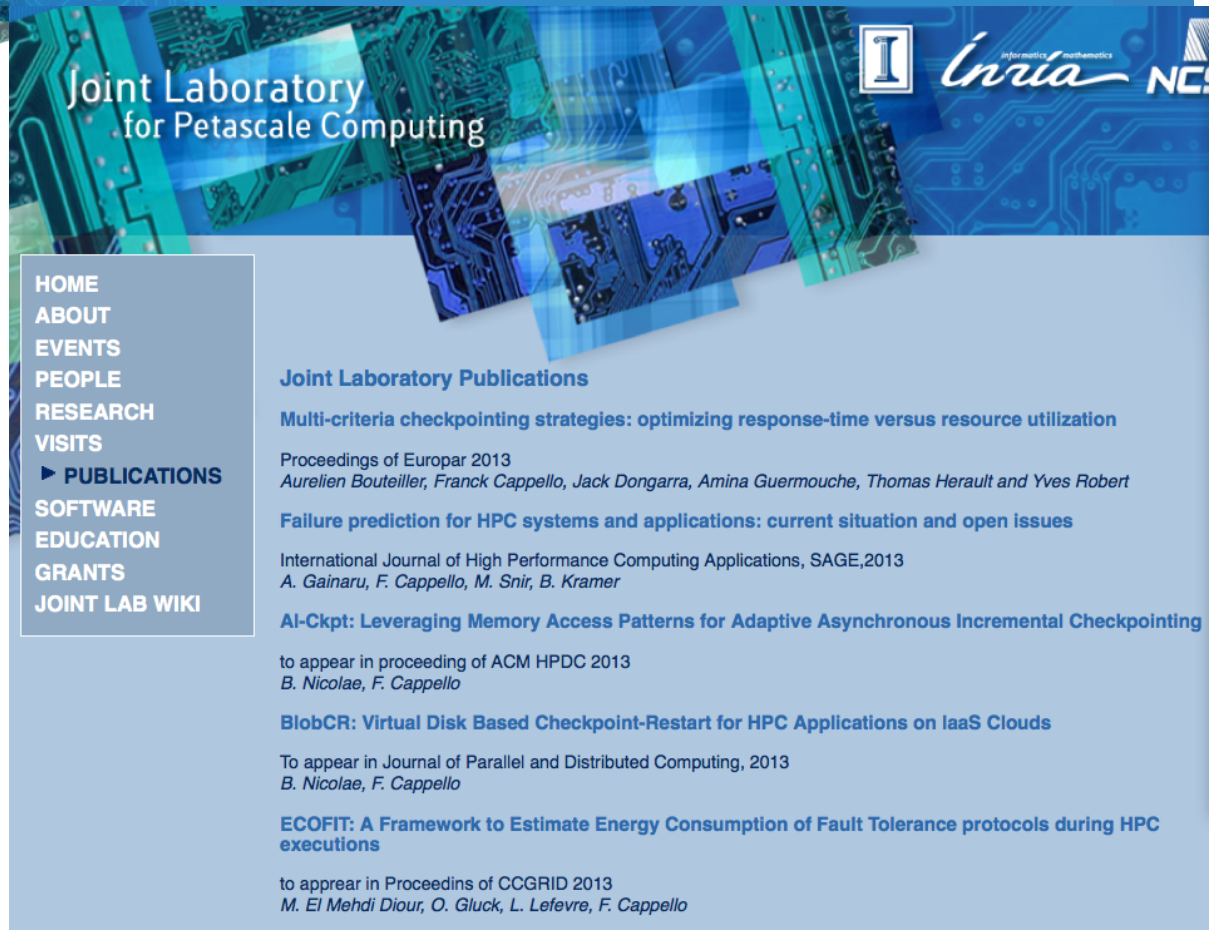




2012-2013 Impact

21 accepted Publications

PUF proposal Accepted (8% Acceptance rate)



Software being transferred to production:

- HELO, ELSA (system event analysis and failure prediction)
- Damaris (I/O and visualization)
- FTI (fault tolerance Interface, multilevel checkpoint/restart)

10th Workshop Highlights

Objectives of the workshop

Present:

- The evolution of the domain with background talks
- Outstanding collaborative contributions
- Results obtained in the past 6 months
- New grand challenges, new research directions
- New collaboration supports (calls, meetings, etc.)

Identify:

- Commonalities
- Collaboration topics
- Researchers/student potential interactions
- Visits

Discuss:

- BlueWaters and MIRA details and time allocations

Joint Laboratory for Petascale Computation

10th Workshop Highlights

INRIA INVENTORS FOR THE DIGITAL WORLD

- Session 1 **Extreme Scale Systems and infrastructures**
- Session 2 **Applications, I/O, Visualization, Big data**
- Session 3 **Resilience**
- Session 4 **Numerical Algorithms**
- Session 5 **Programming models, compilation and runtime**
- Session 6 **Large scale systems and their simulators**
- **ACM/IEEE SC13 Best paper**
- **ACM/IEEE SC13 Best paper candidate**

Joint Laboratory for Petascale Computation

Mini Workshops

NCSA

Inria INVENTORS FOR THE DIGITAL WORLD

Tuesday Afternoon and Wednesday Morning

Small groups and focus on specific topic

More like a brainstorming meeting. Try to identify commonalities

Discuss how the collaboration could be implemented in the next 6 months. The research results will be presented at the next workshop

Try to implement collaboration with visits. Visits could be in two directions: to USA and to France

Workshop Logistics 1/3

- Monday and Tuesday morning sessions in Auditorium
- Tuesday afternoon and Wednesday mini-workshops in rooms 1030 and 1040
- For any question, please ask Beth or Judy at the lobby

Workshop Logistics 2/3

- All lunches will take place in the NCSA atrium
- Breaks will take place in the NCSA atrium
- Diners will take place in different restaurants

- Two mini buses (driven by Marc and Franck) will pick you up at the Hampton 1/4 hour before the diner (as mentioned in the program)

Joint Laboratory for Petascale Computation

Workshop Logistics 3/3

NCSA

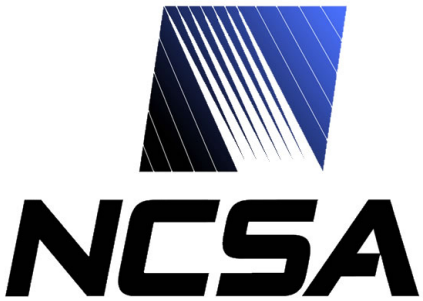
Inria INVENTORS FOR THE DIGITAL WORLD

- Use your laptop for presentation

- We collect ALL presentations
- Presentations will be stored on the join-lab web site.
- Please put you presentation on the USB key, right after your talk.

Joint Laboratory for Petascale Computation

Acknowledgments

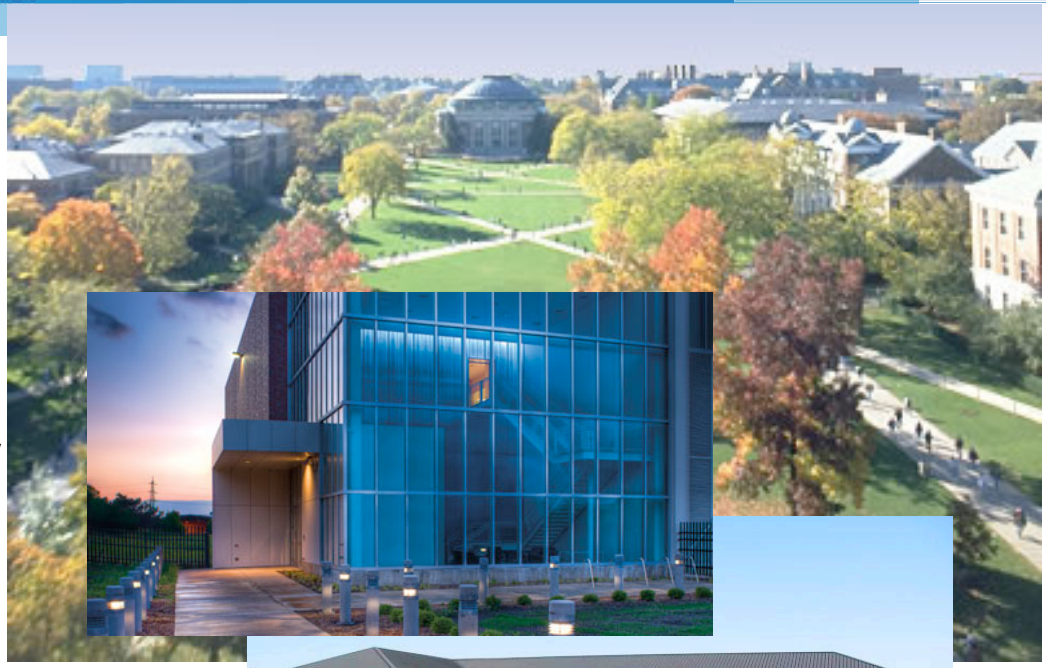


Joint Laboratory for Petascale Computation

Enjoy the Workshop!

NCSA

Inria INVENTORS FOR THE DIGITAL WORLD



Simulation of hurricane Sandy

Cloud top temperature overlaid with horizontal wind vector

Maximum radar reflectivity overlaid with horizontal wind vector