Scalasca
Scalable performance analysis of large-scale parallel applications

Performance-analysis software

- Specifically designed for large-scale systems
- Integrated performance analysis procedure
  - Runtime summaries
  - In-depth studies of concurrent behavior via event traces
- New BSD open-source licence

Features

- Localization of wait states on large processor configurations
- Switching between summaries and traces without recompiling or relinking
- Intuitive graphical user interface
- Flexible measurement configuration
- Support for MPI, OpenMP and hybrid MPI/OpenMP

Supported Platforms

- Cray XT/XE
- IBM Blue Gene
- IBM SP & Blade clusters
- Linux-based PC clusters
- SGI Altix (incl. ICE + UV)
- NEC SX-8/9
- Fujitsu FX / K computer
- Tianhe-1A
- Intel Xeon Phi

www.scalasca.org

NEW!!!
Scalasca 2.0 based on Score-P / OTF2 / CUBE4
Scalasca Measurement & Analysis Workflow

1. Run instrumented target application to produce runtime summary
   - Provides initial insight into the application's run-time behavior
   - Allows optimizing the configuration for subsequent measurements (e.g., filtering of uncritical code regions, estimation of trace buffer requirements, etc.)

2. Generate targeted event traces of critical code regions for closer investigation of concurrent behavior
   - Automatic event trace analysis at the end of measurement searching for inefficiency patterns/wait states (using a parallel trace analysis tool to achieve scalability, executed as part of the same batch job)

3. Examine runtime summary and trace analysis results using an intuitive graphical user interface

Automatic Trace Analysis

- Replay-based trace analysis searches for patterns of inefficient program behavior
- Example: Blocking receiver waiting for message to arrive (Late Sender, see diagram on the right)

Scalability

- Scalability test on 72-rack IBM Blue Gene/P Jugene in Jülich
- ASC Sweep3D benchmark code with fixed problem size/process (weak scaling)
- Trace analysis could be completed with up to 294,912 processes
- Exceptionally good scaling behavior of wait state search (parallel replay)
- Recent experiments show scalability up to 1 million threads on Blue Gene/Q JUQUEEN