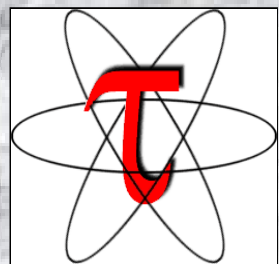


# Tuning and Analysis Utilities in Eclipse

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# *Motivation*



- ❑ Development of efficient high performance applications benefits greatly from performance analysis.
  - Identify bottlenecks
  - Optimize process communication
  - Tune runtime behavior
- ❑ Integrated development environments facilitate software development and maintenance.
  - Consistent development environment
  - Numerous enhancements to development process
  - The standard in industrial software development



# *The Challenge*

- ❑ High Performance Software Development Environments:
  - Tools are often complicated to use
  - Interfaces and mechanisms differ between platforms and operating systems
- ❑ Integrated Development Environment Performance Analysis:
  - Tools are often limited to a single platform or programming language
  - Rarely compatible with 3<sup>rd</sup> party analysis tools
  - Little or no support for parallel projects



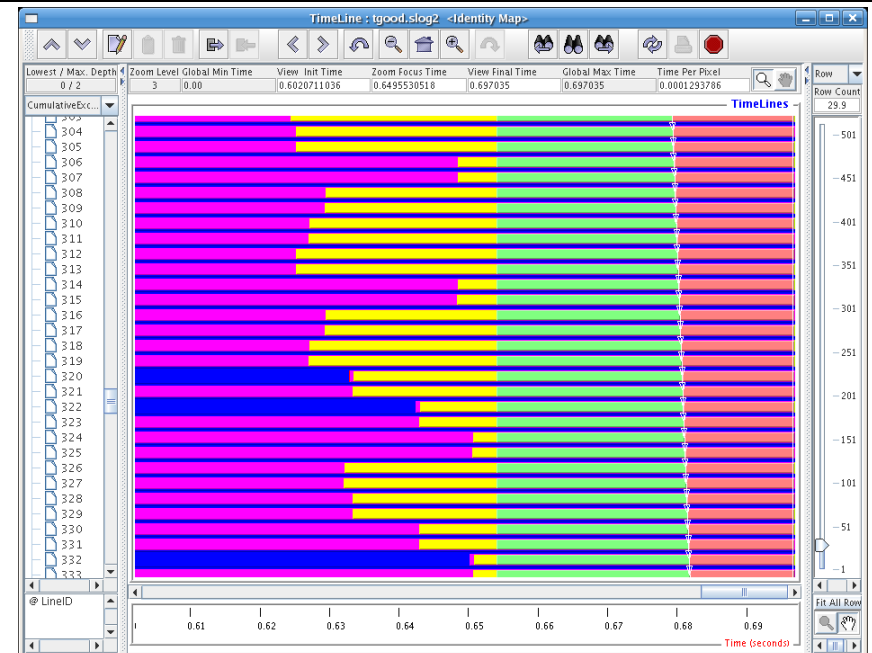
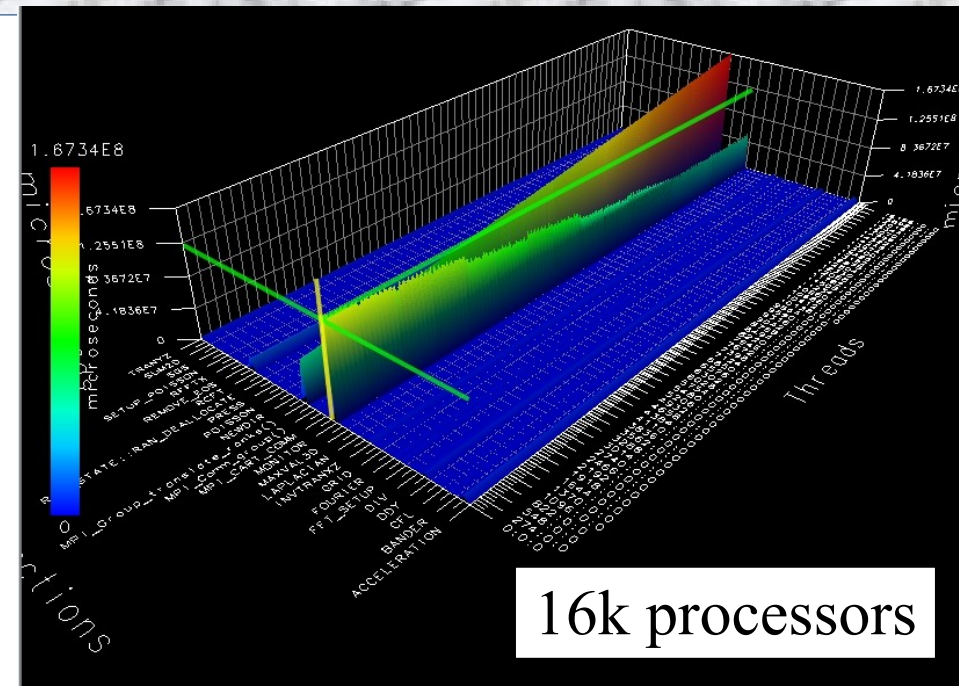
# *TAU Performance Analysis System*

- ❑ Tuning and Analysis Utilities (13+ year project effort)
- ❑ Performance system framework for HPC systems
  - Integrated, scalable, portable, flexible, and parallel
- ❑ Integrated toolkit for performance problem solving
  - Automatic instrumentation
  - Highly configurable measurement system with support for many flavors of profiling and tracing
  - Portable analysis and visualization tools
  - Performance data management and data mining
- ❑ <http://www.cs.uoregon.edu/research/tau>



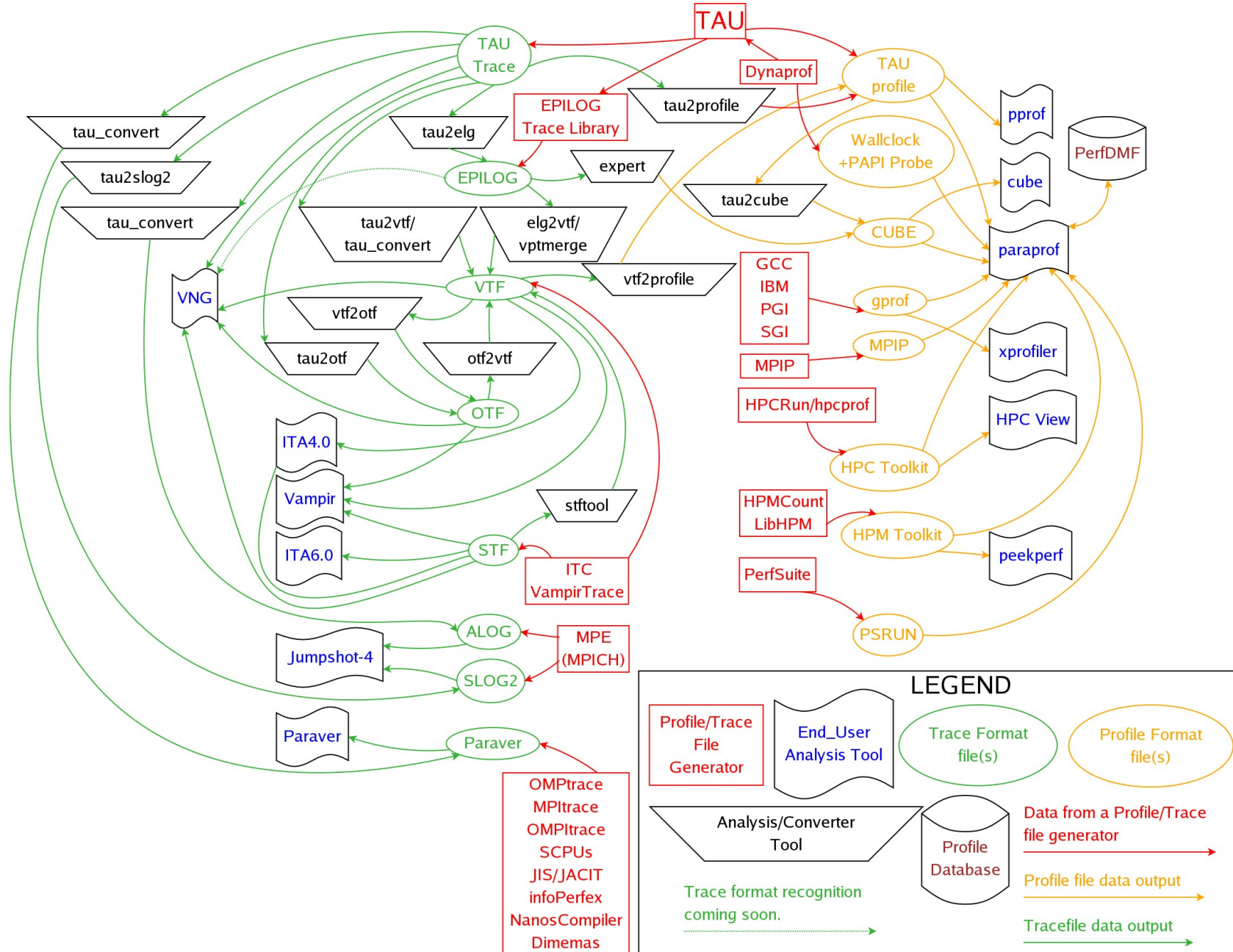
# TAU Analysis

- Performance profiling
  - Flat, callpath or phase-based profile output
  - View in ParaProf or convert to other performance profile formats
- Performance tracing
  - View in portable Jumpshot trace viewer
  - Convert and analyze with other trace tools





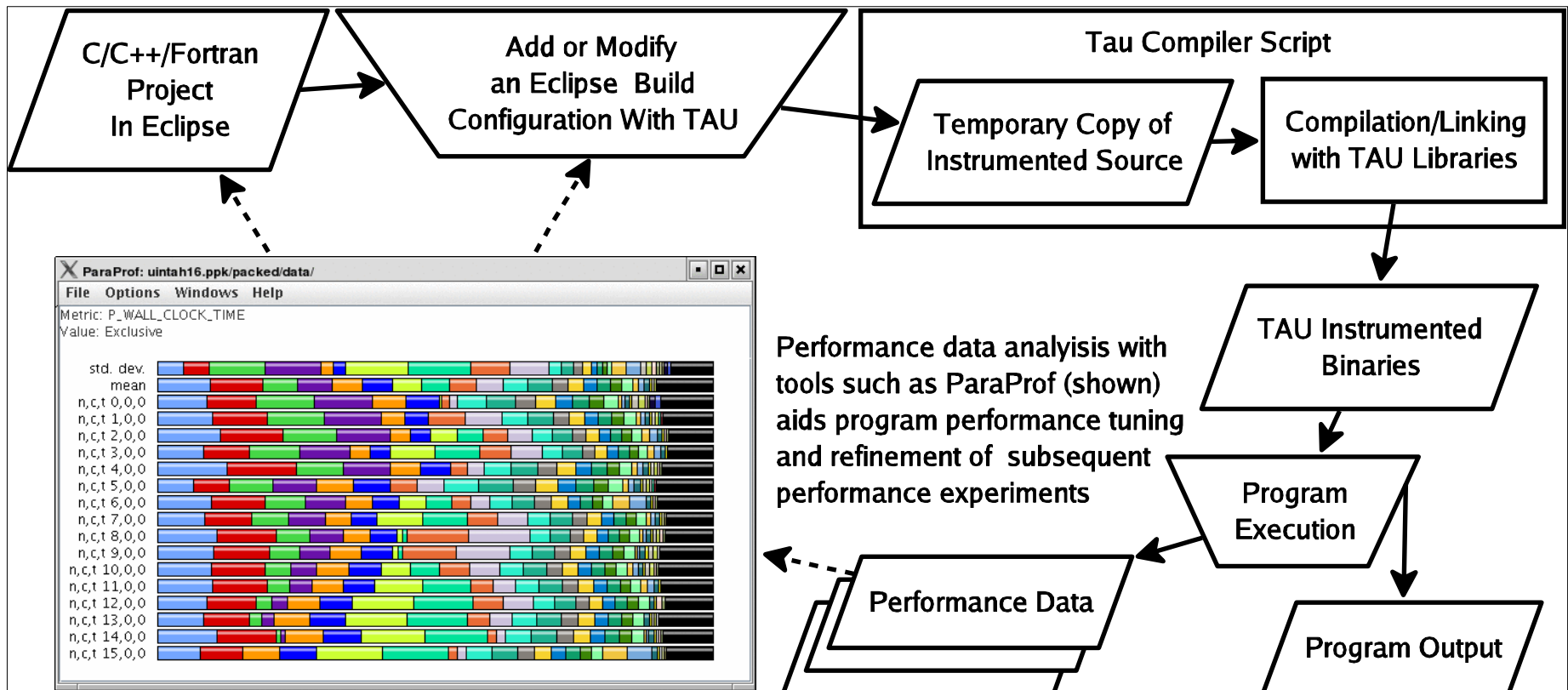
# TAU Data Formats and Tools Support





# The TAU Plug-in for PTP/CDT

- ❑ Inserts TAU's existing auto-instrumentation capabilities into Eclipse's build system
- ❑ Manages runtime configuration settings and environment variables for easy execution of TAU instrumented programs





# *Future Work*

- ❑ Integration of additional TAU components
  - Automatic selective instrumentation based on previous experimental results
  - Trace format conversion from within Eclipse
- ❑ Trace and profile visualization within Eclipse
- ❑ Scalability testing interface
- ❑ User interface enhancements