Intel® VTune™

Intel VTune is an application created by Intel for software performance analysis of serial and multithreaded applications on 32 and 64-bit x86 based machines. VTune Profiler helps analyse the algorithm choices and identify where and how your application can benefit from available hardware resources.

# Code optimization

VTune assists in various kinds of code profiling including stack sampling, thread profiling and hardware event sampling. The profiler result consists of details such as time spent in each sub routine which can be drilled down to the instruction level. The time taken by the instructions are indicative of any stalls in the pipeline during instruction execution. The tool can be also used to analyse thread and storage performance.

Intel® Trace Analyzer and Collector

Intel Trace Collector is a tool for tracing MPI applications. It intercepts all MPI calls and generates tracefiles that can be analysed with Intel Trace Analyzer for understanding the application behaviour. Intel® Trace Collector can also trace non-MPI applications, like socket communication in distributed applications or serial programs.

# Tracing

In software engineering, tracing essentially is a specialized form of logging to record information about the execution of a program at runtime. This information is typically used by programmers for debugging purposes, and additionally, depending on the type and detail of information contained in a trace log, by experienced system administrators or technical-support personnel and by software monitoring tools to diagnose common problems with software.

Quantum ESPRESSO

Quantum ESPRESSO is a suite for electronic-structure calculation and materials modelling at the nanoscale, distributed free software. It is based on density-functional theory, plane wave basis sets, and pseudopotentials. ESPRESSO is an acronym for opEn-Source Package for Research in Electronic Structure, Simulation, and Optimization.