Intel® Cluster Poisson Solver Library Release Notes

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1   Overview

The Intel® Cluster Poisson Solver Library (Intel® CPSL) is a tool set for solving Helmholtz and Poisson problems of a special kind (with separable variables). Intel® CPSL uses an advanced implementation of the modern algorithms. For more experienced users, the library provides options to finer tune the solvers for better performance and usage convenience. The library is available only for a 64-bit Linux* operating system and requires both Intel® Fortran and Intel® C++ compilers, as well as the Intel® Math Kernel Library (Intel® MKL). You can download a trial or non-commercial version of Intel® MKL for Linux* OS from http://downloadcenter.intel.com/default.aspx?iid=subhdr+downloads.

The Intel® CPSL offers:

- **2D Helmholtz solver** – a solver of the 2D Helmholtz and Poisson problems in a rectangular domain with a regular mesh and non-homogeneous boundary conditions.

- Example of a 3D Poisson solver.

The solver employs fast Fourier transforms for solving the Helmholtz problems with separable variables.

The Intel® CPSL package contains the following components:

- Libraries

- Examples

- Documentation.

Note: Intel® CPSL has a "prototype" level of maturity and is expected to continuously evolve in further updates and releases. So, any feedback of yours is greatly appreciated.

2 System Requirements

This section details the processor, disk space, operating system, and other software requirements for installing and using Intel® CPSL.

Processor Requirements

The following processors based on Intel® 64 architecture were used for compatibility testing of Intel® CPSL:

- Intel® Core™2 Duo processor

- Intel® Xeon® processor 50xx, 51xx, 7xxx series

Although the library was not tested on systems based on other Intel® processors, you can use it on such systems. In case you experience any issues, please let us know. To do this, visit the web site where you got the package.

Memory and Disk Space Requirements

Intel® CPSL requires ~10MB of disk space in total (for archive file, extracted files, and all installed components).

Memory and disk space requirements for an application you are tuning may be larger than Intel® CPSL requires. In this case, make sure you have sufficient disk space for running your application along with Intel® CPSL.

Software Requirements

Intel® CPSL has been tested on systems based on Intel® 64 architecture with the following Linux* distributions:

- Red Hat* Enterprise Linux* AS release 4 (Nahant Update 4) (kernel 2.6.9).

Intel® CPSL requires the Intel® MKL version 10.0 Update 1 or higher.

Intel® CPSL requires the Intel® C++ Compiler and Intel® Fortran Compiler versions 10.1 or higher.

Intel® CPSL has been tested for compatibility with the following MPI implementations:

- Intel® MPI 3.1.038

- MVAPICH2* 1.2 built with the Intel® C++ Compiler 10.1 and Intel® Fortran Compiler 10.1

- OpenMPI* 1.2.6 built with the Intel® C++ Compiler 10.1 and Intel® Fortran Compiler 10.1.

Although the library was not tested for compatibility with other compilers and operating systems, you can try to use the library with them. In case you experience any issues, please let us know. To do this, visit the web site where you got the package.

3   Installation

To see the Intel® CPSL installation details, please refer to the Installation and Startup Guide (`CPSL_install.pdf`).

4   Documentation

The following Intel® CPSL documentation is available:

- Installation and Startup Guide, describes steps required to install Intel® CPSL.

- Release Notes (this document), lists systems that were tested for compatibility with Intel® CPSL and describes known issues and product limitations.

- Reference Manual, provides a full-scale product description and usage models.

5   Related Products and Services

Information on Intel® software development products is available at http://www.intel.com/software/products. Some of the related products include:

- The Intel® Software College provides training for developers on leading-edge software development technologies. Training consists of online and instructor-led courses covering all Intel architectures, platforms, tools, and technologies.

- Accelerate software performance using Intel® compilers. Compatible with other tools you use, the Intel® compilers integrate into popular development environments and features source and binary compatibility with other widely-used compilers.

- The Intel® Performance Library Suite provides a set of routines optimized for various Intel® processors.

- The Intel® Math Kernel Library offers highly optimized, extensively threaded math routines for scientific, engineering, and financial applications that require maximum performance.

- The Intel® Integrated Performance Primitives. This highly optimized Intel® software library contains video, imaging, compression, cryptography, audio, speech recognition, and signal processing functions and codec component functions for digital media and data-processing applications.

6   Known Problems and Limitations

3D examples work only if the numbers of intervals in x- and y-directions (can be different) are divisible by the number of MPI processes. Otherwise, the CPSL routine will return error code -1 (see the examples for more details).

7 Feedback and Technical Support

Your feedback is very important to us. To point to an issue with the product and get technical advice, visit the web site where you got the package. Learn there the options that the discussion forum suggests. We do not provide any technical support for this product.

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