Intel is introducing its next generation Intel Xeon Phi processor (codenamed Knights Landing) which is set to change the face of High Performance Computing, bringing unprecedented processing capability in a single socket.

For those who are trying to push the boundaries of what they can achieve with scientific applications and code, Intel Xeon Phi offers a rarely experienced technology leap to take that step forward. But it also presents a challenge for those who quite rightly, want to get the most out of the monstrous capabilities of the new chip.

Here are six key steps you can take to get ready for Knights Landing and actually, by starting early, the first steps will give you better code performance from the Intel Xeon CPUs you are using now!

**PREPARING YOUR APPLICATIONS FOR XEON PHI – 6 KEY STEPS:**

1. **Get an overview of the MPI, OpenMP, I/O and CPU vectorization balance.** This lets you know where to focus your efforts. Allinea Performance Reports combines this in a single one page summary.

2. **Use a source-level profiler** to identify and eliminate current performance bottlenecks and limits. Be aware of MPI, OpenMP, I/O and CPU issues within the code. Allinea Forge contains a powerful source-level profiler.

3. **Improve MPI scalability.** With 72 physical cores per socket, high levels of MPI parallelism are needed to get good performance. A good starting target is one MPI process per physical core.

4. **Identify the hot loops** in the code using the source-level profiler to target your next efforts.

5. **Add OpenMP parallelism to hot loops.** Each physical core has 4 virtual cores in Knights Landing (similar to hyper-threading). One OpenMP thread per virtual core is a recommended starting point. Use the profiler again to improve the result.

6. **Check vectorization of hot loops.** Vectorization is the 3rd level of parallelism. For best performance the Knights Landing’s needs its AVX-512 vector operations to be used. Allinea Forge will confirm your success.

**TIP: Begin the process now to see between 2X and 4X acceleration for most codes, even on current-generation Intel Xeon CPUs.**
ABOUT ALLINEA SOFTWARE
Allinea is the trusted leader in software development tools and application performance analytics for high performance computing and one of the fastest growing companies in the sector. Our commitment to investment in research and in technology partnerships with the industry’s leading centres of expertise and technology providers ensure that in an era of considerable advancement and change, Allinea leads the field in providing tools that enable new technology to achieve its potential.

ALLINEA FORGE
Allinea Forge is the leading combined source-level debugging and performance profiling and optimization tool suite. It provides a single intuitive interface that enables you to optimize your code for any hardware platform. The software is being used to help scientists and developers port their code to next generation Intel processors and across technologies. It enables users to build better, faster code and save development time.

ALLINEA PERFORMANCE REPORTS
Your HPC system is a hugely valuable resource. By making sure applications are running well, you’ll maximize the return on your investment, create capacity for new projects and achieve faster insights from faster running code. Allinea Performance Reports analyzes the applications running on your system to measure their performance and provides clear tuning guidance which allows you to improve them across all technology platforms.

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