



# Intel® Parallel Universe Portal Frequently Asked Questions

February 1, 2010

## General Parallelism Questions

### What challenges are involved in developing parallel applications?

Parallel Computing is bringing a sea of change in information technology, opening up more opportunities and choice for everyone. Intel is committed to solving the challenges associated with parallel computing and helping developers make the manycore shift. There are three key challenges in parallel computing:

- Constructing parallel applications requires new skills. This is true when writing new programs, and when migrating legacy sequential applications to be parallel. Coarse grained methods are best as long as they present enough parallelism; fine grained methods may offer more parallelism, but have an opportunity cost. Balancing these two methods is a challenge, and the solution must help developers express parallelism without doing much of the balancing themselves.
- Coordination of system resources and services without introducing errors is essential. For single-processor systems, when the operating system decides to execute an operation, all of the computing resources are made available to that operation, for some period of time. With parallel computing, software applications compete for resources provided by the multiple cores. Failure modes such as deadlocks, data races and contention must be mitigated.
- Constructing code at an appropriate level of abstraction to make it readable, maintainable and scalable is important. Such “future proofing” is an effort to reduce the amount of code rewrite necessary to take full advantage of the number of cores, as core counts climb to manycore levels. Providing the right levels of abstraction for programmers, so as to avoid programming directly to threads of execution is essential.

### So what’s the big deal about multi-core processors?

It used to be that things like laptops had just one processor in them and software developers could rely on faster processors to provide a performance boost to their applications. Times have changed. Today, the processors that go into everything from hand-held devices, laptop, servers and supercomputers are all multi-core, meaning that one piece of silicon which has more than once processor on it. That’s how increasing amounts of processing power – performance – is being delivered in computers today. To take advantage of this power, developers need to build parallelism into their applications. [Intel® Parallel Universe Portal](#) is one of many tools offered by Intel that help developers build such applications. For more information, go to the Intel Software Development Products page at [intel.com/go/parallel](http://intel.com/go/parallel) and download an evaluation copy of Intel® Parallel Studio.

## Intel® Parallel Universe Portal Questions

### What is the Intel® Parallel Universe Portal?

[Intel® Parallel Universe Portal](#) is an internet-based service that enables software developers to analyze their applications to see how they scale on multi-core computer systems. To use it, all you need is an Intel® Software Network account and an Internet browser (Internet Explorer\*, Firefox\*, Safari\* or Chrome\*).

## What developer problem does the Intel® Parallel Universe Portal help solve?

Multi-threading is one of the most popular ways to enable applications to run well on multicore processors. When threaded code is written well, the performance scales (improves) as the number of cores increase. However, writing code that scales well can be difficult. Knowing how well an application scales is important to improving application performance. [Intel® Parallel Universe Portal](#) is based on Intel® Parallel Studio technology to provide this valuable information about how well an application scales on multicore systems.

## Why not just perform the testing in-house?

While quad-core processors are commonplace, it is less common to have a 16 functional thread system available today to test the scalability of a threaded application. [Intel® Parallel Universe Portal](#) makes it easy for developers to find out how well their threaded application scales as the number of processing cores increase without requiring a test system in-house.

## What are the requirements to use Intel® Parallel Universe Portal?

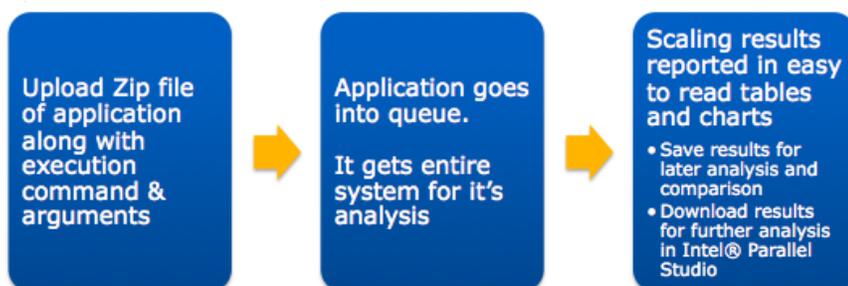
There aren't a lot of requirements. You need a working Internet connection. Just about any browser will work. The executable must be 32-bit C/C++, run on Windows XP\* or Vista\* and must be smaller than 20MB. If you depend on any libraries, you need to statically link them into your executable. It's highly recommended that you build your application as a release build since a debug build may skew the results. When submitting a job for analysis, users can provide arguments required for proper application execution but the application must run without user-interaction.

## What kind of applications does it analyze?

[Intel® Parallel Universe Portal](#) analyzes applications that take advantage of parallelism (for example, threaded applications), which are typically run on systems with multi-core processors - computers with more than one processor. To provide some perspective, most laptop computers sold today have at least a dual-core processor.

## How do I make the tool analyze my application?

First you create a zip file of the executable and all files needed for proper execution and then you fill in the blanks in the browser-based form provided by the system to tell it the command to run the application, and arguments, if any, needed for proper execution. It's a 3-step process that's pretty easy.



## What happens when I submit the application for analysis?

The zip file is uploaded and goes into a queue for execution (each application gets the system to itself so that proper scaling analysis can be done on that application alone). The system informs the developer of job status by noting its status as PENDING, CANCELLED, IN PROGRESS, DONE or that an ERROR has occurred. When the analysis is done, users can click on the DONE link to produce charts and tables of information on application scaling. The reports are also downloadable so they can be saved on the developer's local system. This is useful for developers so they can do additional local scaling analysis with the Intel® Parallel Amplifier capability in Intel® Parallel Studio.

## What happens if the analysis doesn't work?

If the analysis doesn't work, you will see an ERROR link under the Progress column. Clicking on the link produces a list of diagnostics that may be preventing successful analysis. You can try to resolve issues by posting a query on the forum at <http://software.intel.com/en-us/forums/intel-parallel-universe-portal/>.

## How often or how much can I use it?

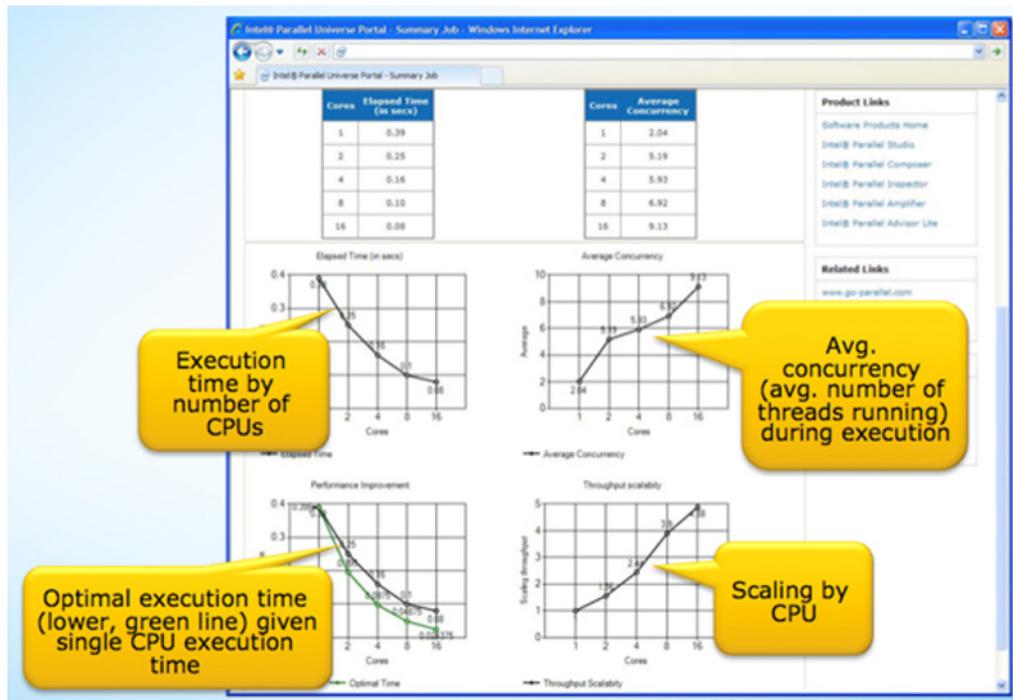
Currently, users can have one job in the queue at a time and submit up to five application sessions per day. In its current form, application analysis is limited to five minutes. Applications that take longer to analyze are terminated, and the analysis is set to ERROR status. In its current preview form, we will be watching this carefully in order to determine the computing environment that best supports the users of [Intel® Parallel Universe Portal](#). These limits are subject to change without notice.

## If I submit multiple sessions, how are the results reported?

Session results are presented chronologically in the browser window. If you have analysis history, we display at least ten of your most recent sessions. Session results can be extracted and saved on your local system so you can compare results over time.

## What information is provided in the results?

After the test is complete, the results are displayed in a way that clearly shows how well the application scales. Information provided includes; Execution time by number of CPUs, Optimal execution time, average concurrency during execution and scaling by CPU. An example results screen is shown below:



The results can be saved for comparison with previous test runs. The results can also be downloaded for further analysis using Intel® Parallel Amplifier which is part of Intel® Parallel Studio. Using Parallel Amplifier, the developer can view performance data aligned with the source code so making changes is simplified.

## What can I do with the results?

The results from the Intel® Parallel Universe Portal test are helpful because the information shows you how well your application scales on computer systems that have multi-core processors. In other words, it tells you if your application is efficiently taking advantage of all the processing power that the computer has to offer. Intel® Parallel Universe Portal reports are exportable and can be used in the Intel® Parallel Amplifier capability that is part of the larger Intel® Parallel Studio. This is a tool that not only identifies such inefficiencies it also takes you to the points in your source code that help you improve efficient use of your computing resources.

## Is there support?

Intel sponsors a user-community for Intel® Parallel Universe Portal. We monitor the site and provide hints, suggestions, and general dialog about issues as they come up. We also welcome suggestions for new features and we are interested in your successes. Other users can also help provide insight into using Intel® Parallel Universe Portal. You can find the forum at <http://software.intel.com/en-us/forums/intel-parallel-universe-portal/>.

## What are the system characteristics of the machine doing the analysis?

There are several server systems available to analyze your software have the following characteristics:

- Microsoft\* Windows Server 2003\* 32 bits R2 Enterprise Edition, Service Pack 2
- Dual Intel® Xeon® X55600 Quad-Core CPU's running with hyperthreading (16 threads)
- 2.80 GHz, 12 GB RAM

This information is listed on the results page. The configuration is subject to change without notice.

## What happens to the files I upload?

All contents of the zip file, including binaries, are deleted immediately upon completion of the analysis. Therefore, you need to upload your binary every time you do an analysis.

## How much does it cost to use?

There is currently no charge for using the [Intel® Parallel Universe Portal](#).

## Are there any special license terms?

Yes. The terms are outlined in the on-line FAQ. Search for "Terms of Use"

## How does this compare with Intel® Parallel Amplifier?

Intel® Parallel Universe is built using the same analysis technology as Intel® Parallel Amplifier. Here are some of the technical differences.

- Parallel Universe is browser-based while Parallel Amplifier is a local application.
- Parallel Universe offers a subset of the analysis that's available in Parallel Amplifier.

However, the data captured by Parallel Universe can be imported into Parallel Amplifier for a more comprehensive, analysis linked to source code.

Visit [Intel® Parallel Universe Portal](#) today and start analyzing your software.