

# Eos Overview



**Eos Composition**

**Eos Access and Billing**

**Eos Queue Policy**

**Eos Compilers, PrgEnv, and Software**

**Documentation**

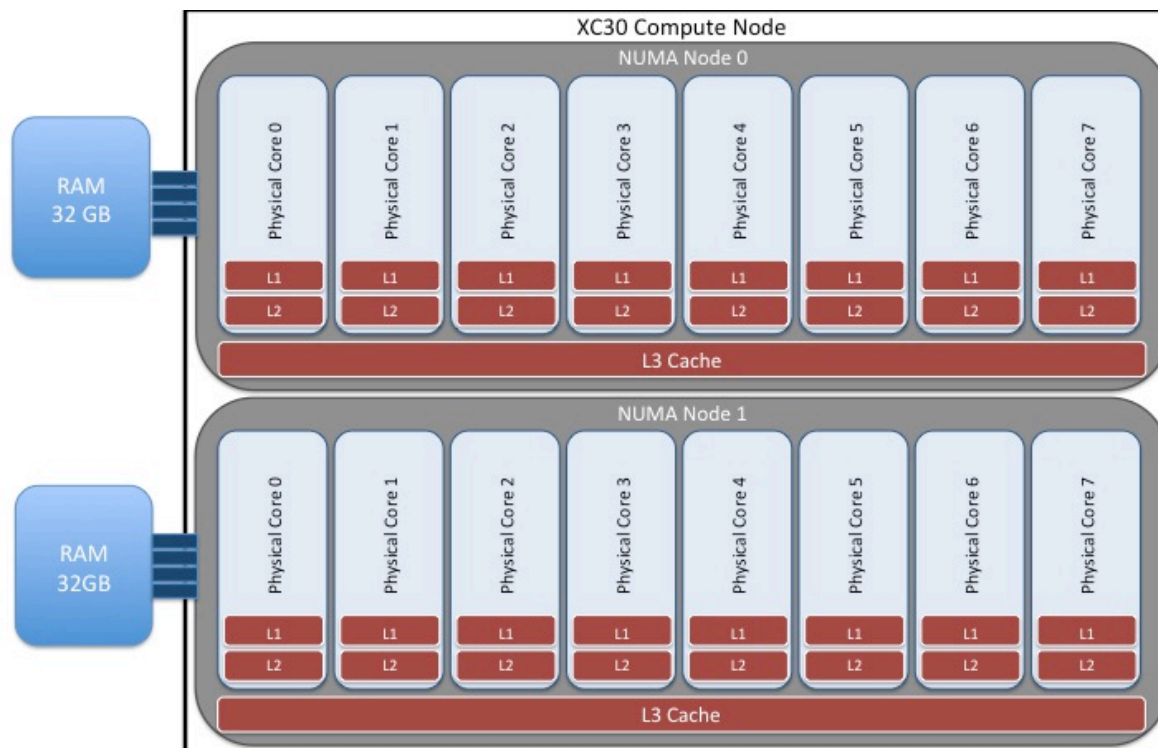
**Know Issues**

**File System**

**Suzanne Parete-Koon**

# Eos Nodes

- 744 compute nodes, 16 physical cores/node, 64 GB/node.
  - Two NUMA Domains L3 cache = 20 MB
  - No Accelerators
  - Hyper threading (32 logical core/node)
- 2 External Logins
- Total of 11,904 cores and 47.6 TB DDR3 SDRAM



# Eos Access and Billing

## For the remainder of this year:

- Eos is prioritized as an extra resource for INCITE users.
- All INCITE projects will automatically be given an account on Eos.
- 30 Eos core hours are charged per node.
  - Hours count for Usage
  - Hours are not subtracted from INCITE Allocation

# Eos Queue Policy

- Queue Policy
  - Unlimited running jobs
  - Limit of (2) *eligible-to-run* jobs per user.
  - Jobs in excess of the per user limit above will be placed into a *held* state, but will change to eligible-to-run at the appropriate time.

Size in Nodes	Wall Clock Limit
< 372	12 hours
>= 372	24 hours

- Feedback?

# Compilers and PrgEnv

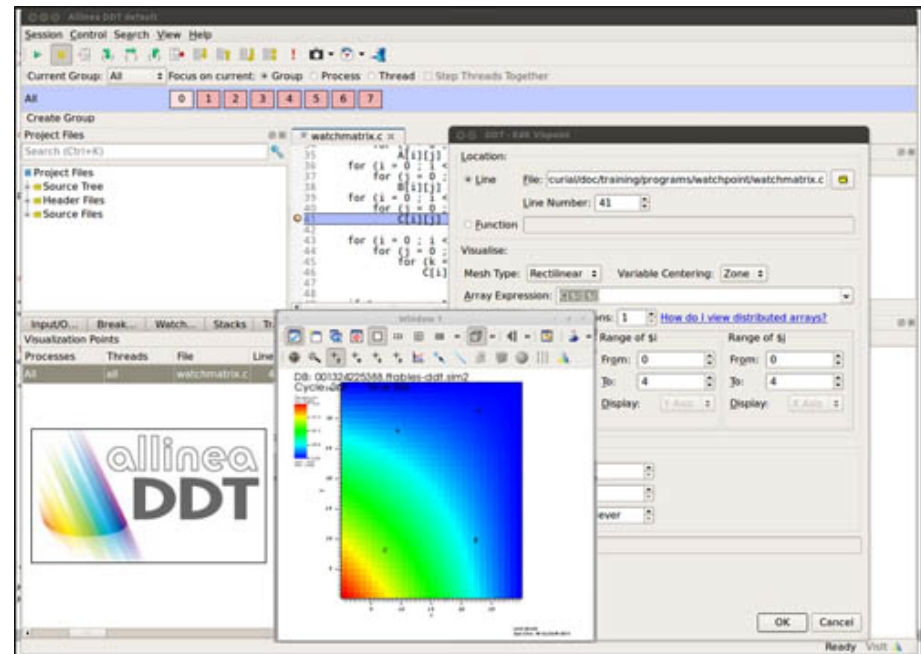
- Our programming environment modules will load the correct pairing of compiler version, message passing libraries, and other items required to build and run.
- Programming environments available PrgEnv-Intel, PrgEnv-Cray, PrgEnv-PGI and PrgEnv-GNU.
- Intel is the default compiler and programming environment.

Module swap PrgEnv-Intel PrgEnv-Cray

- Compiler wrappers ftn, cc, CC still recommended.
- Linking is static by default.

# Profiling and Debugging

- Saleable debugger DDT
- ATP
- Profiling Craypat, perftools
- Papi Hardware counters
- More to come . . .



# Software

- Early times so we are still updating documentation. In the mean time . . .

% module avail (everything)

%Module list (just what's loaded)

```
[eos-ext2] [08:37:50] [~]$ module avail
```


```
----- /opt/cray/craype/default/modulefiles -----  
craype-accel-host          craype-hugepages512M  
craype-accel-nvidia20      craype-hugepages64M  
craype-accel-nvidia35      craype-hugepages8M  
craype-haswell             craype-ivybridge
```

. . .

```
xc-sysroot/5.0.41
```

```
----- /sw/xc30/modulefiles -----  
DefApps          git/1.8.3.4          python/2.7.3  
adios/1.5.0       gsl/1.16             python/2.7.5  
altd/1.0          lammcs/19Sep13       python/3.3.2  
autoconf/2.69     lustredu/1.3(default) ruby/1.9.3-p448  
automake/1.14     mercurial/2.6.3      subversion/1.7.8  
boost/1.54.0      mxml/2.6             subversion/1.8.3  
cmake/2.8.11.2    ncl/6.1.0            vim/7.4  
ddt/4.1-32834     otf/1.12.4salmon  
ddt-memdebug/1.0  pdtoolkit/3.19  
[eos-ext2] [08:37:55] [~]$ G
```

# Documentation



The screenshot shows the OLCF website with a dark header. The OLCF logo is on the left, and social media links are on the right. A search bar is in the top right. The navigation menu is in the center, with a dropdown menu open for 'USER SUPPORT'. The main content area features a large image of a molecular simulation and a headline about TITAN's role in organic photovoltaic research.

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**Researchers Get a New Look at Turbulences**  
September 3, 2013 - 8:10 pm

**OLCF Provides Education with Summer**  
September 3, 2013 - 4:28 pm

**Building Attracts Magnetic Systems Research Impossible Until Now**  
September 3, 2013 - 5:29 pm



## EOS User Guide

Eos is a 744 node Cray XC30 cluster. The processor is the Intel® Xeon®E5-2670. In total, the Eos compute partition contains 11,904 traditional processor cores, and 47.6 TB of memory. Until the end of 2013, Eos is prioritized as a resource to enable INCITE user to meet their goals.



# Documentation From a Search

See this article in context within the following user guides: [Eos](#)

## Hyper Threading Overview

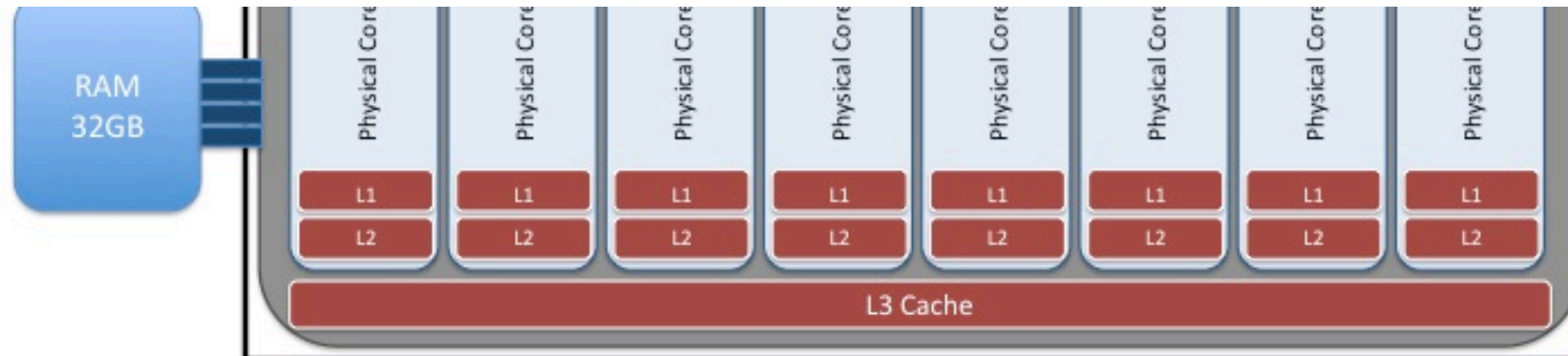
Eos includes Intel processors with Intel's Hyper-Threading technology. When Hyper-Threading is enabled, the operating system recognizes each physical core as two logical cores. Two independent processes or threads can run simultaneously on the same physical core, but because the two logical cores are sharing the same execution resources, the two streams may run at roughly half the speed of a single stream. If a process in a stream running on one of the logical cores stalls, the second stream on that core can use the stalled stream's execution resources and possibly recoup cycles that would have been idle if the streams has been run with only one per physical core. Hyper Threading is supported by all the compilers on Eos — Intel, PGI, Cray and GNU.

**Note:** The `-j2` option to `aprun` enables Hyper Threading on Eos.

## Hyper Threading for MPI Applications

For MPI applications, Hyper Threading can be utilized in a few different ways. One way is by running on half the nodes that you would typically need to allocate without Hyper Threading. The example below shows the code to do so and the resulting task layout on a node.

# Documentation from a search



## 8.12.3. Hyper Threading

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### Hyper Threading Overview

Eos includes Intel processors with Intel's Hyper-Threading technology. When Hyper-Threading is enabled, the operating system recognizes each physical core as two logical cores. Two independent processes or threads can run simultaneously on the same physical core, but because the two logical cores are sharing the same execution resources, the two streams may run at roughly half the speed of a single stream. If a process in a stream running on one of the logical cores stalls, the second stream on that core can use the stalled stream's execution resources and possibly recoup cycles that would have been idle if the streams has been run with only one per physical core. Hyper Threading is supported by all the compilers on Eos — Intel, PGI, Cray and GNU.

# Known Issues

- cmake with the Intel compiler
  - Check for working C compiler fails
  - Adds the `–rdynaimc` flag and tries unsuccessfully to cross compile.

**This has been mended in the Module file**

- However if you still have trouble:
  - explicitly specify the compiler and then force cmake not to check if that compiler works. This can be done with the `-D` options when you issue cmake:

```
$ cmake -D CMAKE_CXX_COMPILER=icc  
-D CMAKE_C_COMPILER_WORKS=TRUE .
```

- cmake works fine with PGI, GNU and Cray compilers.

# New Filesystem

- New Spider II Filesystem – only mounted on EOS
- Data transfer is required for files not in Home or HPSS
- Chris Fuson will tell you more