Titan

• 18,688 physical compute nodes
• 299,008 traditional processor cores
• 18,688 Accelerators “GPGPUs”
• 598 TB of memory.
• 2\textsuperscript{nd} fastest Open Computer in the World
OLCF Currently Provides over 27 quadrillion FLOPS

- 27,000,000,000,000,000 flops/s
- 7,000,000,000 people/Earth
- Assuming the population of Earth could do 1 calculation per second 24/7/365, it would take human kind ~45 days to calculate what Titan can calculate in one second.
Titan Node

Each Titan compute node contains:

- 1 AMD Opteron™ 6274 (Interlagos) with access to to 32 gigabytes of DDR3 memory
- 1 NVIDIA Tesla™ K20X (Kepler) GPU with access to 6 GB of GDDR5 memory.
- GPU and CPU are connected through a PCI express 2.0 interface.
AMD Opteron CPU
1 NVIDIA Tesla™ K20X GPU

PCle Host Interface

GigaThread Engine

1.5 MB L2 Cache

6GB GDDR5 ECC Global Memory
K20X Streaming Multi-processor SMX

SMX:
- 192 Single precision CUDA cores.
  - 192 additions at once.
- 64 double precision floating point cores
- 32 Special Function units
Eos and Lens

- Eos Cray XC30 744 nodes 11,904 traditional processor cores.
  - Until the end of 2013, Eos is prioritized as a resource to enable INCITE user to meet their goals.

- Lens is a Commodity Cluster with 77 nodes
  - Lens’s primary purpose is to provide a conduit for large-scale scientific discovery via analysis and visualization of simulation data generated on larger, flagship OLCF systems.
Everest Visualization Laboratory

Display 1: BARCO
• 37 mega pixel stereoscopic wall made up of 18 monitors.
• Immersive 3-D

Display 2: Planar
• Wall made up of 16 monitors.
• Walls will function independently
## Gemini Torus Bandwidth

<table>
<thead>
<tr>
<th>Link Type</th>
<th>Bits per direction</th>
<th>Clock Rate (Gbits/s)</th>
<th>Bandwidth per Direction (Gbits/s)</th>
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<tbody>
<tr>
<td>X &amp; Z cables</td>
<td>24</td>
<td>3.125</td>
<td>75</td>
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<tr>
<td>Y cables</td>
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<td>37.5</td>
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<td>Y mezzanine traces</td>
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<td>Z backplane traces</td>
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Images courtesy of Cray Inc.