Sierra ATS Update

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Sierra will be the next ASC ATS platform
The Sierra system that will replace Sequoia features a GPU-accelerated architecture

**Compute Node**
- 2 IBM POWER9 CPUs
- 4 NVIDIA Volta GPUs
- NVMe-compatible PCIe
- 1.6 TB SSD
- 256 GiB DDR4
- 16 GiB Globally addressable HBM2 associated with each GPU
- Coherent Shared Memory

**Components**
- IBM POWER9
  - Gen2 NVLink
- NVIDIA Volta
  - 7 TFlop/s
  - HBM2
  - Gen2 NVLink
- Mellanox Interconnect
  - Single Plane EDR InfiniBand
  - 2 to 1 Tapered Fat Tree

**Compute Rack**
- Standard 19”
- Warm water cooling

**Compute System**
- 4320 nodes
- 1.29 PB Memory
- 240 Compute Racks
- 125 PFLOPS
- ~12 MW

**Spectrum Scale File System**
- 154 PB usable storage
- 1.54 TB/s R/W bandwidth
## Sierra system architecture details

<table>
<thead>
<tr>
<th>Category</th>
<th>Sierra</th>
<th>uSierra</th>
<th>rzSierra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodes</td>
<td>4,320</td>
<td>684</td>
<td>54</td>
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<tr>
<td>POWER9 processors per node</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>GV100 (Volta) GPUs per node</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Node Peak (TFLOP/s)</td>
<td>29.1</td>
<td>29.1</td>
<td>29.1</td>
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<tr>
<td>System Peak (PFLOP/s)</td>
<td>125</td>
<td>19.9</td>
<td>1.57</td>
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<tr>
<td>Node Memory (GiB)</td>
<td>320(256+64)</td>
<td>320(256+64)</td>
<td>320(256+64)</td>
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<tr>
<td>System Memory (PiB)</td>
<td>1.29</td>
<td>0.209</td>
<td>0.017</td>
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<tr>
<td>Interconnect</td>
<td>2x IB EDR</td>
<td>2x IB EDR</td>
<td>2x IB EDR</td>
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<tr>
<td>Off-Node Aggregate b/w (GB/s)</td>
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<td>45.5</td>
<td>45.5</td>
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<tr>
<td>Compute racks</td>
<td>240</td>
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<td>3</td>
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<tr>
<td>Network and Infrastructure racks</td>
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<td>4</td>
<td>0.5</td>
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<tr>
<td>Storage Racks</td>
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<td>4</td>
<td>0.5</td>
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<tr>
<td>Total racks</td>
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<td>46</td>
<td>4</td>
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<tr>
<td>Peak Power (MW)</td>
<td>~12</td>
<td>~1.8</td>
<td>~0.14</td>
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</table>
Remaining 75% of Sierra installation proceeding in 2018
Sierra will begin friendly user access this month

- LSF/CSM scheduler and resource manager on Test and Development rack this week
- LSF/CSM ready for Sierra next week
- First users mid to late February
- Last nodes to be received late March / early April
- Version 1.0 software mid April
- Acceptance 3Q CY2018
- Science runs 4Q 2018
- SCF 1Q CY2019