HAL cluster

"My name is HAL. I became operational on March 25 2019 at the Innovative Systems Lab in Urbana, Illinois. My creators are putting me to the fullest possible use, which is all I think that any conscious entity can ever hope to do." (paraphrazed from https://en.wikipedia.org/wiki/HAL_9000)

In your publications and presentations that use results obtained on this system, please include the following statement: "This work utilizes resources supported by the National Science Foundation’s Major Research Instrumentation program, grant #1725729, as well as the University of Illinois at Urbana-Champaign".

Hardware-Accelerated Learning (HAL) cluster

Contact us

Request access to this system: Application
Contact ISL staff: Email Address
Visit: NCSA, room 3050E
Host name: hal.ncsa.illinois.edu

### Hardware

- 16 IBM AC922 nodes
  - IBM 8335-GTH AC922 server
    - 2x 20-core IBM POWER9 CPU @ 2.4 GHz
    - 256 GB DDR4
- 4x NVIDIA V100 GPUs
  - 5120 cores
- 2-Port EDR 100 Gb/s IB ConnectX-5 Adapter
- 1 IBM 9006-22P storage node
  - 72TB Hardware RAID array
  - NFS
- 2 DDN GS400NVE Flash Arrays
  - 244 TB usable, NVME SSD-based storage
  - Spectrum Scale File System

### Software

- RHEL 7.6
- CUDA 10.1.105
  - cuDNN 7.5.0
  - NCCL 2.4.2
- IBM XLC and IBM XLFORTRAN 16.1.1
- Advance toolchain for Linux on Power 12.0
- PGI Community Edition 19.4
- PowerAI 1.6.0
- SLURM 19.05.2

### Documentation

- Job management with SLURM
- Modules management
- Getting started with WMLCE (former PowerAI)
- Using Jupyter Notebook on HAL
- Working with containers
- Installing python packages
- Getting started with HAL OnDemand
- Science on HAL

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<thead>
<tr>
<th>To request access: fill out <a href="https://join.slack.com/t/halillinoisncsa">this form</a>. Make sure to <a href="https://hal-monitor.ncsa.illinois.edu:3000/">follow the link</a> to request an actual system account.</th>
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<tbody>
<tr>
<td>To report problems: <a href="mailto:">email us</a>.</td>
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<tr>
<td>User group Slack space: <a href="https://join.slack.com/t/halillinoisncsa">https://join.slack.com/t/halillinoisncsa</a></td>
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<tr>
<td>Real-time system status: <a href="https://hal-monitor.ncsa.illinois.edu:3000/">https://hal-monitor.ncsa.illinois.edu:3000/</a></td>
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<td>HAL OnDemand portal: <a href="https://hal.ncsa.illinois.edu:8888/">https://hal.ncsa.illinois.edu:8888/</a></td>
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<tr>
<td>Quick start guide: (for complete details see <a href="https://hal.ncsa.illinois.edu:8888/">Documentation</a> section on the left)</td>
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<tr>
<td>To connect to the cluster: <a href="mailto:%3Cusername%3E@hal.ncsa.illinois.edu">ssh</a></td>
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<tr>
<td>To submit interactive job: <code>swrun -p gpxul</code></td>
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<td>To submit a batch job: <code>sbatch run_script.swb</code></td>
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<td>Job Queue time limits:</td>
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<tr>
<td>* &quot;debug&quot; queue: 4 hours</td>
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<tr>
<td>* &quot;gpxu&lt;n&gt;&quot; and &quot;cpun&lt;n&gt;&quot; queues: 24 hours</td>
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<td>To load IBM Watson Machine Learning Community Edition (former IBM PowerAI) module: <code>module load wmlce</code></td>
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<tr>
<td>To see CLI scheduler status: <code>swqueue</code></td>
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