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." (paraphrased 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
<table>
<thead>
<tr>
<th>Host name: hal.ncsa.illinois.edu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
</tr>
<tr>
<td>• 16 IBM AC922 nodes</td>
</tr>
<tr>
<td>• IBM 8335-GTH</td>
</tr>
<tr>
<td>• AC922 server</td>
</tr>
<tr>
<td>• 2x 20-core IBM</td>
</tr>
<tr>
<td>• POWER9 CPU @ 2.4 GHz</td>
</tr>
<tr>
<td>• 256 GB DDR4</td>
</tr>
<tr>
<td>• 4x NVIDIA V100 GPUs</td>
</tr>
<tr>
<td>• 5120 cores</td>
</tr>
<tr>
<td>• 16 GB HBM 2</td>
</tr>
<tr>
<td>• 2-Port EDR 100 Gb/s IB</td>
</tr>
<tr>
<td>• ConnectX-5 Adapter</td>
</tr>
<tr>
<td>• 1 IBM 9006-22P storage node</td>
</tr>
<tr>
<td>• 72TB Hardware RAID array</td>
</tr>
<tr>
<td>• NFS</td>
</tr>
<tr>
<td>• 2 DDN GS400 NVE Flash Arrays</td>
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<tr>
<td>• 244 TB usable, NVME SSD-based storage</td>
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<tr>
<td>• Spectrum Scale File System</td>
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</tbody>
</table>

**Software**

- CentOS 7.7
- CUDA 10.2.89
- cuDNN 7.6.5
- NCCL 2.5.6
- IBM XLC and IBM XL Fortran 16.1.1
- Advance toolchain for Linux on Power 12.0
- PGI Community Edition 19.4
- PowerAI 1.7.0
- SLURM 20.02.0

**Documentation**

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

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To request access: fill out [this form](#). Make sure to [follow the link on the application confirmation page](#) to request actual system account.

**Frequently Asked Questions**

To report problems: [email us](#).

User group Slack space: [https://join.slack.com/t/halillinoisncsa](https://join.slack.com/t/halillinoisncsa)

Real-time system status: [https://hal-monitor.ncsa.illinois.edu:3000/](https://hal-monitor.ncsa.illinois.edu:3000/)

HAL OnDemand portal: [https://hal.ncsa.illinois.edu:8888/](https://hal.ncsa.illinois.edu:8888/)

Quick start guide: (for complete details see [Documentation](#) section on the left)

**To connect to the cluster:**

```
ssh <username>@hal.ncsa.illinois.edu
```

**To submit interactive job:**

```
swrun -p gpux1
```

**To submit a batch job:**

```
swbatch run_script.swb
```

**Job Queue time limits:**

- "debug" queue: 4 hours
- "gpux<n>" and "cpun<n>" queues: 24 hours

**To load IBM Watson Machine Learning Community Edition (former IBM PowerAI) module:**

```
module load wmlce
```

**To see CLI scheduler status:**

```
swqueue
```