Introduction to AMD Accelerator Cloud (AAC) for Exercises

Bob Robey and David Doscher

AMD
together we advance_

Contacts for System Issues -- AAC

- Please contact either Bob Robey Bob.Robey@amd.com or David Doscher David.Doscher@amd.com about any issues with the training system during the workshop.
- David Doscher is the technical expert behind setting up the training environment.
- Also, can use the slack application and send a private message to either of us or to one of the other presenters for questions about specific topics.

AAC notes

- You should have gotten an invite to participate in the workshop
  - Problems, request support by email to bob.robey@amd.com or in the slack channel
- AMD Accelerator Cloud (AAC) Training Container
  - Ubuntu® 22.04
  - ROCm version 5.6.0 (latest release)
  - GCC is version 11
  - Clang/LLVM is version 16

File spaces

- Home Directory
  - Persistent storage is at `/datasets/teams/hackathon-testing/<userid>`. Your home directory will be set to this directory.
  - $HOME=/datasets/teams/hackathon-testing/<userid>
  - Files in your home directory should persist across container restarts and be available from another container with the same userid on systems at the same hosting location.

Logging into AAC

- Accessing AAC
- ssh USERNAME@aac1.amd.com -p <###>

- To simplify the login to AAC, you can add the following to your .ssh/config file.

- # AAC
  - Host aac
  - User <USERNAME>
  - Hostname aac1.amd.com
  - #IdentityFile <path>/<private key file> # customize location of key file
  - IdentityFile id_ed25519 # file is in .ssh directory
  - ServerAliveInterval 600
  - ServerAliveCountMax 30

- The ServerAlive* lines in the config file may be added to avoid timeouts when idle.

- Now you can login with ssh aac -p <###>

File copying

You should be able to copy files in or out with the `scp` command.

- In: `scp -i <path>/<keyfile> -P #### <file> USER@aac1.amd.com:~/<path>/<file>`
- Out: `scp -i <path>/<keyfile> -P #### USER@aac1.amd.com:~/path/to/your/file ./`

You can also use `rsync` command

- `rsync -avz -e "ssh -i <path>/<keyfile> -p ####" <file> <USER>@aac1.amd.com:~/path/to/your/files`

Environment -- modules

Modules using Lua modules

- aomp/5.4.2 -- AMD OpenMP® compiler
- clang/14-15 -- Clang/LLVM standard compiler installations
- gcc/11-12 -- GCC standard compiler installations
- hipfort/0.4 -- Fortran wrappers for hip calls
- openmpi/4.1.5 -- GPU-aware MPI
- omniperf/1.0.8 -- AMD performance analysis tool
- omnitrace/1.9.0 -- AMD trace profiler
- rocm/5.6.0 -- ROCm software stack including hip and hip libraries

Compiler modules set the C, CXX, FC flags. Only one compiler module can be loaded at a time. hipcc is in the path when the rocm module is loaded.

Module commands

- module avail
- module load <package>

Environment -- Slurm

Slurm configuration with single queue LocalQ

sinfo

```
| PARTITION | AVAIL  | TIMELIMIT | NODES | STATE | NODELIST   |
|-----------|--------|-----------|-------|-------|------------|
| LocalQ    |  up    | 2:00:00   | 1     | idle  | localhost  |
```

Slurm commands

- salloc can be used to schedule a long-term interactive session
- sbatch is used to submit a job to the batch queue
- squeue will show the jobs running in the batch queue

- The slurm configuration is sort of a combination of a login node and backend compute resources
  - Queue resources are the same as the local node
  - GPUs are still available without going through Slurm

Installed software

- emacs
- vim
- miniconda
- autotools
- cmake
- tmux
- boost
- eigen
- fftw
- gmp
- gsl
- hdf5-openmpi
- lapack
- magma
- matplotlib
- parmetis
- mpfr
- mpi4py
- openblas
- openssl
- swig
- numpy
- scipy
- h5sparse

Resources for Workshop

- Course Webpage: https://www.hlrs.de/training/2023/gpu-amd
- Slack Channel https://join.slack.com/t/hlrshq/shared_invite/zt-20pfqevwh-4zYSeymtEQM~nYn8E6y3vg
- Zoom https://us06web.zoom.us/j/85367267606?pwd=V1NnUm1RRkFCMG95RzA5bEtUVVl2QT09
  - Meeting ID: 853 6726 7606
  - Passcode: 488919
- Slides from these presentations are at the Course Webpage
  - Also in a directory on AAC at: /users/examples/HLRS_Workshop
- HPC Training Examples are available
  - On the web: https://github.com/AMD/HPCTrainingExamples
  - On the AAC system: directory /users/examples – copy the directory with
    - mkdir HPCTrainingExamples && cp –r /users/examples/* HPCTrainingExamples

Disclaimer

The information presented in this document is for informational purposes only and may contain technical inaccuracies, omissions, and typographical errors. The information contained herein is subject to change and may be rendered inaccurate for many reasons, including but not limited to product and roadmap changes, component and motherboard version changes, new model and/or product releases, product differences between differing manufacturers, software changes, BIOS flashes, firmware upgrades, or the like. Any computer system has risks of security vulnerabilities that cannot be completely prevented or mitigated. AMD assumes no obligation to update or otherwise correct or revise this information. However, AMD reserves the right to revise this information and to make changes from time to time to the content hereof without obligation of AMD to notify any person of such revisions or changes.

THIS INFORMATION IS PROVIDED ‘AS IS.” AMD MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE CONTENTS HEREOF AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES, ERRORS, OR OMISSIONS THAT MAY APPEAR IN THIS INFORMATION. AMD SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT WILL AMD BE LIABLE TO ANY PERSON FOR ANY RELIANCE, DIRECT, INDIRECT, SPECIAL, OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF ANY INFORMATION CONTAINED HEREIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.


AMD