

## Amber18-bf16

### Webpage

<http://ambermd.org/>

### Version

Amber18-bf16 + AmberTools19-bf8

### Build Environment

- ▶ Intel Compiler 17.0.8
- ▶ Intel MKL 2017 update 4
- ▶ Intel MPI 2017.0.4
- ▶ CUDA 9.1.85
- ▶ Python 2.7

### Files Required

- ▶ Amber18.tar.bz2
- ▶ AmberTools18.tar.bz2
- ▶ (Amber18 update.1-16; obtained by update\_amber script)
- ▶ (AmberTools18 update.1-14; obtained by update\_amber script)
- ▶ (AmberTools19 update.1-8; obtained by update\_amber script)

### Build Procedure

```
#!/bin/sh
VERSION=18
TOOLSVERSION=18

INSTALL_DIR="/local/apl/lx/amber18-bf16"
TARBALL_DIR="/home/users/${USER}"

PARALLEL=12

#-----
module purge
module load intel_parallelstudio/2017update8
module load cuda/9.1

export AMBERHOME=${INSTALL_DIR}
export CUDA_HOME="/local/apl/lx/cuda-9.1"

export LANG=C
export LC_ALL=C

# install directory has to be prepared before running this script
if [ ! -d $AMBERHOME ]; then
  echo "Create $AMBERHOME before running this script."
  exit 1
fi

# the install directory must be empty
if [ "$(ls -A $AMBERHOME)" ]; then
  echo "Target directory $AMBERHOME not empty"
  exit 2
fi

ulimit -s unlimited

# prep files
cd $AMBERHOME
bunzip2 -c ${TARBALL_DIR}/Amber${VERSION}.tar.bz2 | tar xf -
bunzip2 -c ${TARBALL_DIR}/AmberTools${TOOLSVERSION}.tar.bz2 | tar xf -

mv amber${VERSION}/* .
rmdir amber${VERSION}

# apply patches and update AmberTools
echo y | ./update_amber --upgrade
./update_amber --update
# configure python separately (miniconda)
AmberTools/src/configure_python
$AMBERHOME/bin/amber.conda install mkl-rt --yes

echo "[GPU serial edition (three versions)]"
./configure --no-updates -cuda gnu
make -j${PARALLEL} install && make clean

echo "[GPU parallel edition (three versions)]"
./configure --no-updates -mpi -cuda gnu
make -j${PARALLEL} install && make clean
# tests of GPU versions will be done elsewhere
```

```
echo "[CPU serial edition]"
LANG=C ./configure --no-updates -mkl intel
make -j${PARALLEL} install
. ${AMBERHOME}/amber.sh
make test.serial
make clean

echo "[CPU openmp edition]"
LANG=C ./configure --no-updates -openmp -mkl intel
make -j${PARALLEL} install
make test.openmp
make clean

echo "[CPU parallel edition]"
LANG=C ./configure --no-updates -intelpi -mkl intel
make -j${PARALLEL} install
export DO_PARALLEL="mpirun -np 2"
make test.parallel
export DO_PARALLEL="mpirun -np 4"
cd test && make test.parallel.4proc

cd $AMBERHOME
make clean && chmod 700 src
```

## Notes

- ▶ GPU version binary can work on P100 and V100.
- ▶ module name is "amber/18/bugfix16".
- ▶ Installation directory is /local/apl/lx/amber18-bf16.
- ▶ Job samples can be found at /local/apl/lx/amber18-bf16/samples directory.
- ▶ Environment setting script (amber.sh, amber.csh) can be found in /local/apl/lx/amber18-bf16 directory. Note that those scripts do not set CUDA-9.1 paths.
- ▶ CUDA-9.1 setting is necessary if you want to use CUDA version binaries.
- ▶ You can find test logs in logs/ directory.