GEOS OSU Micro-Benchmarking Build on Azure

1. Build OSU Micro-Benchmarks for AMD Milan on Azure (GCC 12.3.0; Intel MPI 2021.12.1)

1.1. Proposed Directory Structure

```
# Pick a new directory in either your nobackup ($NOBACKUP) or home ($HOME) directory

cd $NOBACKUP or $HOME
mkdir -m 0700 benchmarks
mkdir -m 0700 benchmarks/gmao

cd benchmarks/gmao
mkdir -m 0700 cascade/
mkdir -m 0700 cascade/{apps,output,results,src}
mkdir -m 0700 milan
mkdir -m 0700 milan/{apps,output,results,src}
```

Directory Note:

- The "apps" directory will contain the benchmark binaries needed
- The "output" directory will house the raw slurm output
- The "results" directory is where the refined output (csv files) will be stored
- The "src" directory will contain the source files for any benchmarks we compile.

1.2. Build OSU Micro-Benchmarks for AMD Milan on Azure

```
# Allocate a Milan interactive session for 2 hours to build

salloc --job-name=OSUbenchBuild -N 1 --ntasks-per-node=20 --partition=hbv3 --time=2:00:00


# Purge any previously loaded modules, load the GCC 12.3.0 compiler and Intel MPI 2021.12.1

module purge

source /shared/spack-hbv3/share/spack/setup-env.sh

spack load intel-oneapi-mpi@2021.12.1

spack load gcc@12.3.0

spack find --loaded
```

Side note on module loading: In order to use module avail on the Azure system, you must use this command first: `source /usr/share/modules/init/bash`

```
umask 0077
cd /your-preferred-directory/benchmarks/gmao/milan/src/
tar xvf osu-micro-benchmarks-7.2.tar.gz
cd osu-micro-benchmarks-7.2/

./configure CC=`which mpicc` CXX=`which mpicxx` --prefix=$HOME/objective-2/benchmarks/gmao/milan/apps/osu-micro-benchmarks-7.2/gcc_12.3.0-intel_oneapi_mpi_2021.12.1
make -j 20
make install

cd ..

rm -vr osu-micro-benchmarks-7.2/
```