Guidance to run Horovod TensorFlow ResNet50 model on Nvidia H100 GPUs

Log in to the ACES cluster and run the commands below.

$cd $SCRATCH

$mkdir horovod

$cd horovod

$git clone https://github.com/tensorflow/benchmarks

We used the Nvidia NGC TensorFlow container for this project. You can either download the container by yourself or use the container we stored in the shared directory.

 # Don't forget to set your directory in the job file where you saved the container.

#Option 1: Pull the container by yourself

$srun --time=02:00:00 --mem=100G --pty bash -i

$cd $SCRATCH

$mkdir container

$cd container

$export SINGULARITY_CACHEDIR=$TMPDIR

$module load WebProxy

$singularity pull docker://nvcr.io/nvidia/tensorflow:23.03-tf2-py3

#Option 2: Use the container we stored in a shared directory

the path to the container is /scratch/data/containers/tf2-23.03-py3.sif

$cd benchmarks

create a slurm job file horovod-tf-h100-ngc.sh and copy and paste the content below to it.

$sbatch horovod-tf-h100-ngc.sh

```
#! /bin/bash
##NECESSARY JOB SPECIFICATIONS
#SBATCH --job-name=aces_h100
#SBATCH --time=01:00:00
#SBATCH --nodes=8
#SBATCH --ntasks-per-node=1
#SBATCH --cpus-per-task=8
#SBATCH --partition=gpu
#SBATCH --gres=gpu:h100:1
#SBATCH --mem=100G
#SBATCH --output=./result/aces_h100.%j
##SBATCH --nodelist=ac036,ac037,ac038,ac039,ac040,ac046,ac047,ac048
#SBATCH --exclusive
##SBATCH --reservation=workshop

echo $SLURM_JOB_ID
hostname

date

# load all the necessary modules
module purge
module load WebProxy
module load GCC/10.3.0  OpenMPI/4.1.1

cd /scratch/user/$USER/horovod/benchmarks

for i in {1..5}
do
   mpirun -np 8 -x NCCL_IB_DISABLE=0 -x NCCL_IB_CUDA_SUPPORT=1 -mca btl_tcp_if_include
ib0 -x NCCL_SOCKET_IFNAME=ib0 -x NCCL_DEBUG=INFO --bind-to none --map-by slot --mca
plm_rsh_args "-p 50000" singularity exec --nv
/scratch/data/containers/tf2-23.03-py3.sif python
scripts/tf_cnn_benchmarks/tf_cnn_benchmarks.py --variable_update=horovod
--model=resnet50 --batch_size=128
done

date
```