ANSYS LS-DYNA

ANSYS LS-DYNA software provides convenient and easy-to-use access to the technology-rich, time-tested explicit solver without the need to contend with the complex input requirements of this sophisticated program. Introduced in 1996, ANSYS LS-DYNA capabilities have helped customers in numerous industries to resolve highly intricate design issues. >ANSYS Mechanical users have been able take advantage of complex explicit solutions for a long time utilizing the traditional ANSYS Parametric Design Language (APDL) environment. >These explicit capabilities are available to ANSYS Workbench users as well. The Workbench platform is a powerful, comprehensive, easy-to-use environment for engineering simulation. CAD import from all sources, geometry cleanup, automatic meshing, solution, parametric optimization, result visualization and comprehensive report generation are all available within a single fully interactive modern graphical user environment.

To run ANSYS LS-DYNA in batch mode you can utilize/modify the default ansysdyna.pbs script and execute it via the qsub command.

```
#!/bin/bash
#PBS -l nodes=2:ppn=24
#PBS -q qprod
#PBS -N DYNA-Project
#PBS -A OPEN-0-0

#! Mail to user when job terminate or abort
#PBS -m ae

#!change the working directory (default is home directory)
#cd <working directory>
WORK_DIR="/scratch/work/user/$USER"
cd $WORK_DIR

echo Running on host `hostname`
echo Time is `date`
echo Directory is `pwd`
echo This jobs runs on the following processors:
echo `cat $PBS_NODEFILE`

module load ANSYS

#### Set number of processors per node
procs_per_host=24
#### Create host list
hl=""
for host in `cat $PBS_NODEFILE`
```

```
do
 if [ "$hl" = "" ]
 then hl="$host:$procs_per_host"
 else hl="${hl}:$host:$procs_per_host"
 fi
done

echo Machines: $hl

# prevent ANSYS from attempting to use scif0 interface
export MPI_IC_ORDER="UDAPL"

lsdyna161 -dis -usessh -machines "$hl" i=input.k
```

Header of the pbs file (above) is common and description can be find > on this site. SVS FEM recommends to utilize sources by keywords: nodes, ppn. These keywords allows to address directly the number of nodes (computers) and cores (ppn) which will be utilized in the job. Also the rest of code assumes such structure of allocated resources.

Working directory has to be created before sending pbs job into the queue. Input file should be in working directory or full path to input file has to be specified. Input file has to be defined by common LS-DYNA .**k** file which is attached to the ansys solver via parameter i=

Without setting environment variable MPI_IC_ORDER=“UDAPL”, ANSYS will fail to run on nodes with Xeon Phi accelerator (it will use the virtual interface of Phi cards instead of the real InfiniBand interface and MPI will fail.