Metis on HPC

What is Metis?

METIS is a set of serial programs for partitioning graphs, partitioning finite element meshes, and producing fill reducing orderings for sparse matrices. METIS is designed to partition graphs and meshes, to compute fill-reducing orderings of sparse matrices, and to compute block-orderings of partitioned matrices. It can be used to partition graphs and meshes, and to compute fill-reducing orderings of matrices. METIS is written in C and is available for download in both source code and precompiled binary form. It is developed and maintained by the Department of Computer Science at the University of Minnesota.

Links:

Official Website

Manual

Versions Available:

The following versions are available on the cluster:

- Metis v5.1.0

How to load METIS?

To load METIS, use the following commands:

```
#Load the METIS module
module load metis/5.1.0
```

To verify if the module and dependencies are loaded correctly, use the following command.

```
#Show all the modules loaded
module list
```

This should list all the METIS dependencies that are loaded.

How to use METIS?

Here are all the command line arguments tools and their description:

Operation	4.x stand-alone program	5.x stand-alone program
Partition a graph	pmetis kmetis	gpmetis
Partition a mesh	partnmesh partdmesh	mpmetis
Compute a fill-reducing ordering of a sparse matrix	oemetis onmetis	ndmetis
Convert a mesh into a graph	mesh2nodal mesh2dual	m2gmetis
Graph format checker	graphchk	graphchk

Table 1: Mapping between the old 4.x and the new 5.x command-line programs.

Users can also use METIS's API using C, C++ and Fortan by using supported libraries. See the manual for additional information about this usage,

For demonstration, download the sample graph file from the following command,

```
# Sample graph files
svn checkout https://github.com/KarypisLab/METIS/trunk/graphs
```

Use the following sample slurm script to run gpmetis on graph files,

```bash
#!/bin/bash

# Specify the name of the job
#SBATCH --job-name=my_metis_job
# Specify the number of nodes and cores to use
#SBATCH --nodes=1
#SBATCH --ntasks-per-node=4

# Specify partition and quality of service
#SBATCH -p main
#SBATCH --qos main
# Specify the maximum wall time for the job
#SBATCH --time=24:00:00

# Load the necessary modules
module load metis/5.1.0

# Run the METIS executable, graph is the downloaded directory
gpmetis graph/mdual.graph 10 -niter 10000

# The output will be written to a file with the same name as the input
file,
#but with a .part.<num_parts> suffix
```

Where to find help?

If you are confused or need help at any point, please contact OIT at the following address.

https://ua-app01.ua.edu/researchComputingPortal/public/oitHelp