CS 598: Parallel Migratable Objects

Fall 2014

Due Date: September 4th, 10 PM CDT

This MP is an introductory assignment to learn how to build Charm++ and run Charm++ programs. You will also learn how to use the `Projections` performance analysis and visualization tool.

For learning Charm++ programming and concepts, please refer to the Charm++ Manual, the Charm++ Tutorial, and the Charm++ Webpage.

Step 1: To run Charm++ programs, you need to have a Charm++ build installed. On both EWS and Taub (the campus cluster), there are two installations of Charm++ that can be used. The path is the same on both machines.

- /home/acun2/charm/net-linux-x86_64

- /home/acun2/charm/net-linux-x86_64-smp

If you want to build your own installation, follow the build instructions here. For Linux we recommend the following build line:

- `./build charm++ net-linux-x86_64 -j8`

For Mac we recommend the following build line:

- `./build charm++ net-darwin-x86_64 -j8`

You can also run the interactive smartbuild script and pick your build options using `./build`.

For this MP0, you only need to use EWS. Taub has a batch system to submit jobs which you will be required to use later, however for this MP it is optional.
For EWS login instructions go to EWS FAQ page.
For Taub login instructions go to Taub User Guide.

Step 2: An svn repository for the class has been created here, where you can find the Charm++ code for MP0.

- Checkout the code from the repository by:
  `svn co https://subversion.ews.illinois.edu/svn/fa14-cs598lvk/netID`
  where netID is your actual netID

- A directory named mp0 should be created, go into that directory:
  `cd netID/mp0`

- Analyze the code and run the program with the command `make test`. It should print "Total number of primes within the range [0 - 100000] is 9591." In the program, the Master chare creates k chares. The i'th Worker chare created is responsible for computing the number of primes between [i*M .. (i+1)*M]. Each Worker chare returns their count to the Master chare. M and k are command line arguments. You can change these numbers in the `Makefile` and experiment.

To run a program on Taub you need to submit batch scripts. A sample batch script is included in your SVN repositories.

Step 3: After running the program, you will see `Projections` logs created in the same directory. Analyze them using the `Projections` tool, take a snapshot of the timeline of the program, and turn it in. `Projections` can be downloaded from here and the `Projections` manual can be found here.

Submission: Submission will be done via your SVN repository.

- For each file F you create and want to check in, do:
  `svn add F`

- And frequently (after you have modified F and have a newer version) do:
  `svn ci F`

- There will be a penalty for late submissions.