HDReplay

Joahnn Weging

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2   HDReplay

HDReplay is a benchmark which is capable to replay a MPI-Program. It can't redo exactly the same computation as the original program but it can replay every single MPI-Command. HDReplay uses the traces files generated by HDTrace.

3   Operation breakdown

3.1   Brief explanation of the traces

Every rank of the MPI-Program has it's own trace file. The name of the file looks like this.

```
<program name>_<hostname of the node>_<rank>_<thread>.trc
```

The name of the trace file can be generated automatically out of the project file. When starting HDReplay each rank will read the traces file with the same rank. This implies that you have to start HDReplay with the same count of ranks like the original traced program.

3.2   Reading the project file

First of the program reads the project file. The project file contains the topology. At the moment HDReplay only reads the hostname the rank was executed on to generate the name of the corresponding trace file. Further more the project files contains the correlation of the ranks and the communicators. This is needed for for the communicator-id used in the trace files to identify the communicator used with a collective call.

3.3   Reading the trace file

Each trace file will be read by its rank / thread and stored into a list. One element of the list contains the function name and the values of the parameters it takes.

3.4   Replay the trace file

All MPI-functions are stored inside a hashtable. The key of the hashtable is the name of the function and the value is a pointer to the function taking the necessary parameters.
The replay function iterates over the list generated out of the trace file. In each iteration the function takes the next MPI-function out of the

4   Performance measuring