LittleFe CPU Load Monitor Version 1.0
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Developer: Zach Goodwyn
Adviser: Dave Toth

Description

The LittleFe CPU Load Monitoring software was designed to give a real time display of the CPU utilization of each CPU core in the cluster. When the application is started, it opens an X window with six graphs. Each graph displays the CPU utilization for a node in the system. Since the LittleFe is comprised of six nodes with a dual core processor in each node, the blue and red colors on the graph denote the individual core information. The program uses MPI to gather the data needed from each node every second. The information is then used to update the graph on the display. Each graph holds the five most recent values for each core's utilization. When a new utilization value is added, the oldest value is bumped off the left edge of the graph. The data points are connected with straight lines. "Core One's", lines are drawn in Blue, while "Core Two's", line are drawn in red. Underneath each graph there is a label for each of the cores. Next to these labels, the numerical value for the core utilization is displayed in the appropriate color. To terminate the program, click on the "X" box on the upper right hand of the display.

Using the CPU Monitor

To use the CPU monitor, you must first compile the source code file into a binary file. Once the file is compiled, you must create a special hosts file to use when running the program. Then you must push the binary file to all of the nodes in the LittleFe. Finally, you can run the CPU monitor. **Please note that the CPU Monitor software was designed to run with all 6 nodes of the LittleFe powered up. It has not been tested with fewer than 6 nodes and we know that there will be problems if it runs with fewer than 6 nodes powered up.**

Compiling the CPU Monitor Software

Make a directory. We will call the directory ***cpumon*** and assume that for the rest of the steps, but you can use a different directory name if you desire to. Copy the source code file ***cpumon_v1.0.cpp*** to your ***cpumon*** directory. Navigate to the ***cpumon*** directory and type

```
mpiCC cpumon_v1.0.cpp -lX11 -o cpumonitor
```

and hit the ***Enter*** key. That produces a binary file called ***cpumonitor***.

Creating the Hosts File

Run the ***bccd-snarfhosts*** command and copy the ***~/machines*** file that the command produced into your ***cpumon*** directory and rename it as ***cpumon_machines***. If you are in the ***cpumon*** directory, you can do this by typing

```
cp ~/machines ./cpumon_machines
```

and hitting the ***Enter*** key.

Edit the ***cpumon_machines*** file in your ***cpumon*** directory so that each node has 1 slot instead of 2.

Distributing the Binary File to All of the Nodes in the LittleFe

Run the ***bccd-syncdir*** command for the ***cpumon*** directory. If you are currently in the ***cpumon*** directory, you can type

```
bccd-syncdir .
```

and hit the ***Enter*** key. When the bccd-syncdir command has completed, you will see output telling you where the files have been sync'd to. Usually it is a location like ***/tmp/node000-bccd***. You will use this location to run the program in the next step.

Running the Program

To run the program, if the directory where the files were sync'd to is ***/tmp/node000-bccd*** type

```
mpirun -np 6 -machinefile ./cpumon_machines /tmp/node000-
bccd/cpumonitor
```

and hit the ***Enter*** key. Note there should be no line break in the command above!