Nebula Hardware Challenge Submission

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1 Introduction

This document outlines the various components of the evaluation scheme defined by the competition guidelines.

2 Architecture

The architecture uses a hexagonal toroidal mesh for the NoC. This particular structure improves overall bandwidth and drops latency by increasing the number of connections to a particular router.

Each GPU comes attached with a router with both a master and slave component. Given that we're using the AXI protocol, the router i/o and FSM have been provided in verilog. Each router is connected to 6 "buddy" routers, forming the hexagonal toroidal mesh.

Each router communicates via the AXI protocol. The AXI protocol was used to allow for simplicity, however the CHI protocol would be more efficient if cross-computing was the goal.

3 Testing and Analysis

3.1 Bandwidth Testing

3.2 Latency Testing