

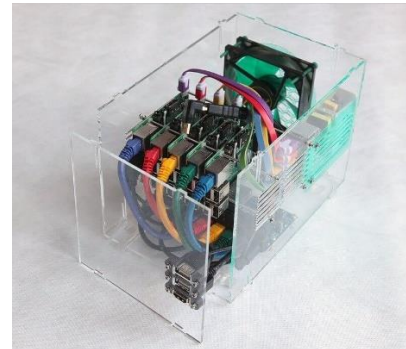
Raspberry Pi “Bramble(s)” [Two 5 node clusters or One 10 node cluster]

Background

These Raspberry Pi 3B+ based computing cluster(s) were constructed as part of a cross-Department project conducted by students and faculty In Meteorology and Computer Science, with the aim of performance and operational testing of the Weather Research and Forecasting “WRF” suite. It also provided an opportunity to further explore novel enclosure and system build questions. It also provides a chance to investigate flexible configuration small form factor systems, as the 10 nodes can be operated either as two five node clusters, or one ten node cluster.

Technical Specifications

- Processing (2/5 or 1/10 nodes): Quad Core 1.2GHz Broadcom BCM2837 64bit CPU
- Interconnect: Gigabit Ethernet (1x 100 Base Ethernet port per node)
- Power: 1 USB Charging Hub per 5 node (cluster runs on 1 standard outlet and one commodity power strip)
- RAM: 1GB per node
- Storage: 16 GB+ MicroSD storage/node
- Operating System: Raspbian Linux
- Cooling: 1x 90mm external fan per 5 node set (with blue LED) plus onboard aluminum heat sinks
- Custom acrylic enclosures – fabricated with assistance from Mech. Eng.



Curricular/Other Uses

- Parallel and Distributed Computing Elective (Graduate and Undergraduate levels)
- Conference demonstrations (American Meteorological Society, 2019)

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