

High-Performance Computing: Assignment 1

Adrian F. Clark: alien@essex.ac.uk

2016–17

when	before noon on Fri 11 th Nov (week 6)
what	a single PDF file
weighting	20% of module mark
return	3 weeks from submission

Introduction

This is the first of two assignments for *CE816: High-Performance Computing*. This assignment asks you to build a small compute cluster and document your work so that others would be able to do the same — this is described further below. The instructions are deliberately left fairly vague because part of the assignment is for you to use your initiative in discovering what is available, making informed choices and learning how to do the detailed work.

You are expected to carry out the practical part of this assignment during the scheduled laboratory sessions for this module. You will be working with computer hardware and so will work in a laboratory with the relevant electronics equipment; there will be demonstrator support to hand.

The task

1. You are required to build a small compute cluster from Raspberry Pi modules. The Raspberry Pi is a single-board computer about the size of a credit card which features an ARM processor roughly equivalent to a 700 MHz Pentium. The board has a built-in 100 Mb/s Ethernet and can be powered by USB or a mobile phone charger. The Linux operating system and any locally-needed files are stored on an SD card. These computers and associated hardware will be available during the lab sessions.
2. Having constructed the cluster, you are to install MPI, the *Message Passing Interface* software for cluster computing, on it and show that it works by running one of its test programs.

Reporting requirements

You are required to submit a report of no more than 8 A4-sized pages, including titles *etc* and written using an 11-point font, that describes:

- the procedure you followed, with enough detail for someone else to reproduce what you did;
- where a decision or choice had to be made, a discussion of what choices were available and why you chose what you did choose; and
- how well the resulting cluster works.

Your report should follow general guidelines in the *Postgraduate Handbook*. Note that your work should *not* contain your name; you should identify it using your registration number. Marks will be awarded according to the schedule shown to the right.



marks	criterion
40%	description of procedure
30%	consideration of alternatives
30%	presentation and use of English
