University of BRISTOL

ACRC
Remote Hosting of HPC

Simon Burbidge 23 May 2018
simon.burbidge@bristol.ac.uk

bristol.ac.uk

Introduction

- University procuring Blue Crystal 4.
- Computer room in Physics suffering from lack of maintenance and mid-life failure of chillers
- Quick solution required
- Slough (eventually) chosen

Project Initiation

- Slow
- IT Services unfamiliar with contracts
- Took ages to get funding activated

Installation

- BC4 purchased and installed by OCF
- Acceptance failing due to overheating

Facility failings

- Blue Crystal 4 overheating due to insufficient airflow into cold aisle
- Poor containment leading to warm air being drawn into cold aisle
- Facility operators not responding/recognising the fault
- Required several on site visits to demonstrate and measure failings
- Required high level visit to site management to rectify
- (Solution to add more vented floor tiles)

Operationally

- IT Services provided network (with lots of ports blocked) and no services (authentication, DNS, e-mail etc)
- …. The remote operation had not been properly thought through
- HPC team created alternatives to fix these problems and persuaded networks to open some ports

Production

- Network performance
  - Terrible performance under load, unpredictable
  - Took ages to diagnose, eventually found packet loss!!!
  - Lots of head scratching, sit down meeting with networks and realised DDOS prevention “feature” in switch was throwing packets away.
  - Disabled the feature and magically the problem went away.
- Access Issues
  - Complex and slow procedures to gain access to system for engineers

Moving on

- Network performance
  - Latency of network is very high. Quite a few systems will not run across the link as a result.
  - Users have to use VNC for remote graphical access
- Access issues
  - Persist, although better understood now, we have an admin person at out end to deal with it
- On site visits are costly
  - In time and hotel bills. It is too far away.
- Facility on site personnel not suitable for HPC work.
- Lack of clarity in billing
  - Ongoing, detailed costs of billing are not provided
- Lack of flexibility
  - Space is full – unable to expand
- Data sharing between systems much more difficult than on-campus
- Containment method not great for different equipment in same area
- Environment is stable

Costs

- Is it cheaper than on-campus?
  - Probably not
- Is it easier than on-campus?
  - Definitely not, personnel costs much higher
- Problem diagnosis more difficult and time consuming
- Is facility more energy efficient than on-campus?
  - Is about the same

Note on networks

- Network design is crucial for remote working
  - Needs to be explored in advance and in great detail
  - Requirements need to be exact
  - Don’t forget services (eg. Authentication)
  - Performance is greatly affected by latency – this can be ameliorated in certain use cases, but not always
  - Basic choice is either
    - Totally isolated remote system
  - Or
    - Extend campus network to remote site

Conclusions

- Problems in that remote site is not geared for HPC (but may be fine for IT)
- No convincing cost savings
- Q? Stability of offering and price ….