Caelum
The Lab’s model data centre
Malcolm Scott
80 Dell R320 servers
- 6 cores; 64GB RAM
- Xeon E5-2430L V2: Ivy Bridge
- Lights-out serial/KVM/media
- Local SSD and HDD storage

4 Arista 7050Q 40Gbit switches

6 ExaLINK 50 layer-1 switches

6 smart PDUs (individual metering and switching)

1.5 km of cabling
(and about 15 m of Dymo label)

16 m³ of packaging processed
(0.9 Gray Whales)
Default 10/40Gbit network topology

- Full bisection bandwidth
- Can disable links to form other topologies if needed

Any 24 servers (via ExaLINK fabric)
ExaLINK layer-1 switches form a reconfigurable interconnection fabric

Each server’s two 10Gbit ports can be connected at runtime to one (or more) of:
- Any Arista switch
- Any other nearby server port
- A dedicated monitoring NIC
- Any other ExaLINK
Downstream to 14 servers
(two 10G links to each)

Four 10G links to each switch

Monitoring
(1 ExaNIC per two pods)

Inter-rack distribution
### Server 214

**Power:**

1

**Current user:**

mas90

**Location:**

pod 2, slot 14

**Hardware type:**

dell_12g

**Inventory number:**

19256

**Serial number:**

563FD22

**BMC:**


**PDU:**

[pdu-rack1-R.caelum.cl.cam.ac.uk](http://pdu-rack1-R.caelum.cl.cam.ac.uk) outlet 18

**Serial console:**

[serial-rack1.caelum.cl.cam.ac.uk](http://serial-rack1.caelum.cl.cam.ac.uk) port 1

**BMC MAC address:**

C8:1F:66:CB:E7:39

**Primary MAC address:**

C8:1F:66:CB:E7:37

**Management switch:**

gn11-sw1.net; main, port 2/14; secondary, port 2/42; BMC, port 2/28

(Yes, the management network is mostly IPv6-only 😊)
So what’s it for?

- You tell me.

- Short-term scale-out experiments; borrow the whole cluster for a few days
  - (Lower-priority: preemptible long-term smaller allocations to fill spare capacity)

- Bring your idea
- I will help you plan the deployment

- (It’s not for long-term service hosting.)
  - Little resilience, because this is an experimental facility only
  - No UPS; no RAID...
“Bring your idea,” longer-term

- This part of interest to people with grants
- This is an EPSRC designated “Small Research Facility”
- Charging model (being) agreed with EPSRC & University
- Put it on your grant application
  - They will know to expect this
- Details: talk to Andrea Kells

- We’d like this to fund the facility long-term
Caelum is open for business

Tell me how you’d like to use it!

What I’ve described is **Phase One**

Larger computation servers coming later, and bulk storage

There’s scope for tweaks/additions to suit use cases we haven’t thought of