

Moving to the Shared Data Centre

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Introduction

- Linacre 2010
- How the USDC works for a College
- Network setup options
- Presentation from David Birds
- The Move
- Linacre 1 year on
- What's next?
- Questions/Discussion

Linacre 2010

Server room located in the roof

- Heat from 3 floors below
- Heat from outside
- Dodgy lift plus a flight of stairs

Linacre 2010

Regular cooling failures

- 1-2 major failures per year
- Water leaks
- No space for backup air con
- Inconvenient failures
- 'Belt and braces' measures

Linacre 2010

Power

- Power supply "on the limit"
- Oxford's power sucks
- Major failures approximately once a year

Linacre 2010

Relocation on site

- Proposal to move to the basement
- No real net gain
- £20k+

Linacre 2010



How does the USDC Work for a College?

It's up to you

- Move all your main servers. Relocate your current systems to the USDC
- Use a USDC rack as a Disaster Recovery environment
- Extend your server room to a USDC rack
- Research projects
- Host 3rd party systems

How does the USDC Work for a College?

How do I get in?

- Access 24/7/365
- Don't need to be accompanied

How does the USDC Work for a College?

How do I get in?

- Key fobs
- Fingerprints are recorded on fob only
- Fob into building, fob and fingerprint into DC via portal, fob into cabinet

How does the USDC Work for a College?

How do I get in?



How does the USDC Work for a College?

How do I get in?

If you forget to lock your cab, the USDC staff are alerted and contact you.

The whole building is covered by CCTV and OWL/eduroam are available inside the data centre.

Network Setup Options

What are my options?

- Annexe VLAN (1Gb)
- Dedicated subnet in USDC range
- A combination

Network Setup Options

What are my options?

If you want to do something different:

sis@it.ox.ac.uk

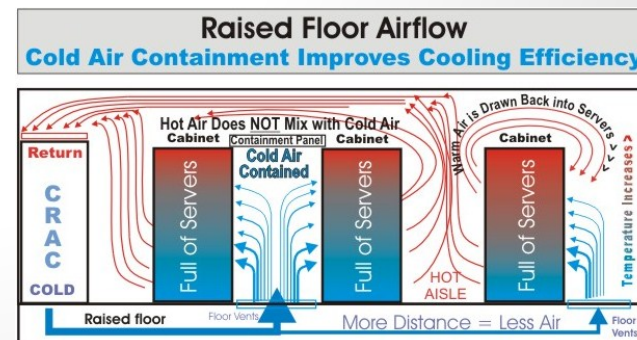
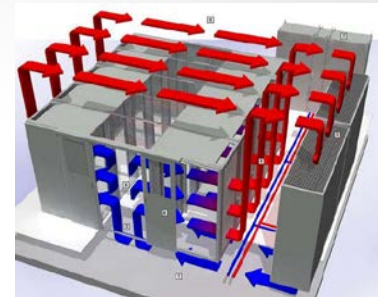
A benefit of being an early adopter is that you can help to develop and shape the services offered.



- Cold aisle containment to maximise cooling efficiency.
- Air conditioning works more efficiently when there is a large temperature differential between the return air (hot) and the outlet air (cold).
- 700mm raised floor plenum allows air to be channelled from below the equipment.

The Shared Data Centre

- Chilled water air conditioning recycles heat to heat the water all year around and the building in winter months.
- 'Lights out' approach with PIR motion sensing lighting, bios level remote management via KVM over IP including remote power on/off
- Use of virtualised server services to minimise hardware required



The Shared Data Centre

Resiliency

- **Data Centre Power** – 2 separate substations supplying separate 400 kVA UPS's.
- **Cabinet Power** – each cabinet has 2 power bars which are fed from separate power distribution units which are fed from independent UPS's.
- **Dual Circuit Air Conditioning, with dual pump feeds** – a dual circuit enabled one circuit to be taken out of commission for servicing etc. allows the other circuit to continue operating with no loss of service.
- **Dual Network Feed** – the data centre has two incoming optical fibre feeds via diverse routes from the University Backbone network.



Access Control



Biometric Proximity Reader

Anti-tailgating security portal



Cabinet door showing electric lock



CCTV

3 mega pixel Mobotix cameras with digital pan, tilt and zoom



The Shared Data Centre Project

in summary:

- Dual resilient Uninterruptible Power Supplies (UPS).
- Dual power bars to each cabinet from separate feeds.
- Power usage monitored on a per socket basis
- Secure Location - Biometric access control, monitored CCTV
- Localised high pressure water vapour fire suppression system in the floor and ceiling
- No single point of failure for University Backbone network as IT Services critical services are dual-homed (i.e. Nexus)

I don't want to be the guinea pig!



The Move

How we handled the move

- Network switch and test server located in rack
- 1-2 servers moved per day early in the morning

Linacre 1 Year on

100% uptime

No services have been impacted, and when something breaks, David's team have to fix it!

It's not just Linacre's kit they are looking after. Nexus, Medical Sciences, OxCERT, HFS, OUP and many others have vital services running in the USDC.

1 Year on

College Staff Reaction



1 Year on

Speed comparison

Test conducted copying a folder containing 25 JPG images, a 725MB MKV movie and a 618MB ISO. Total size 1.35GB

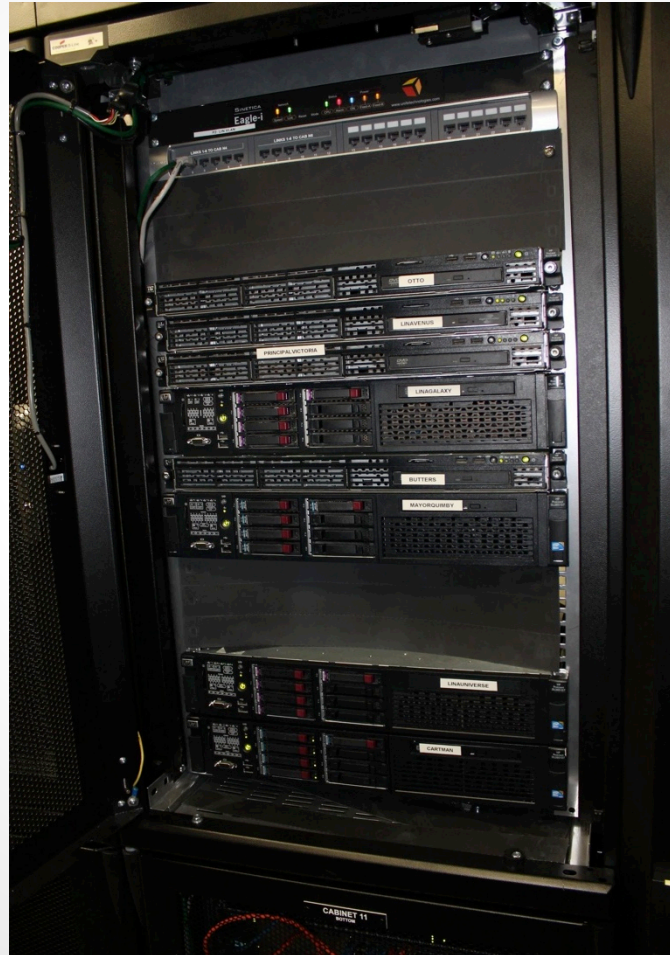
Copy conducted 3 times for each environment

Copying time from local desktop to local Win 2008 R2 file server
3:58, 3:31, 3:37

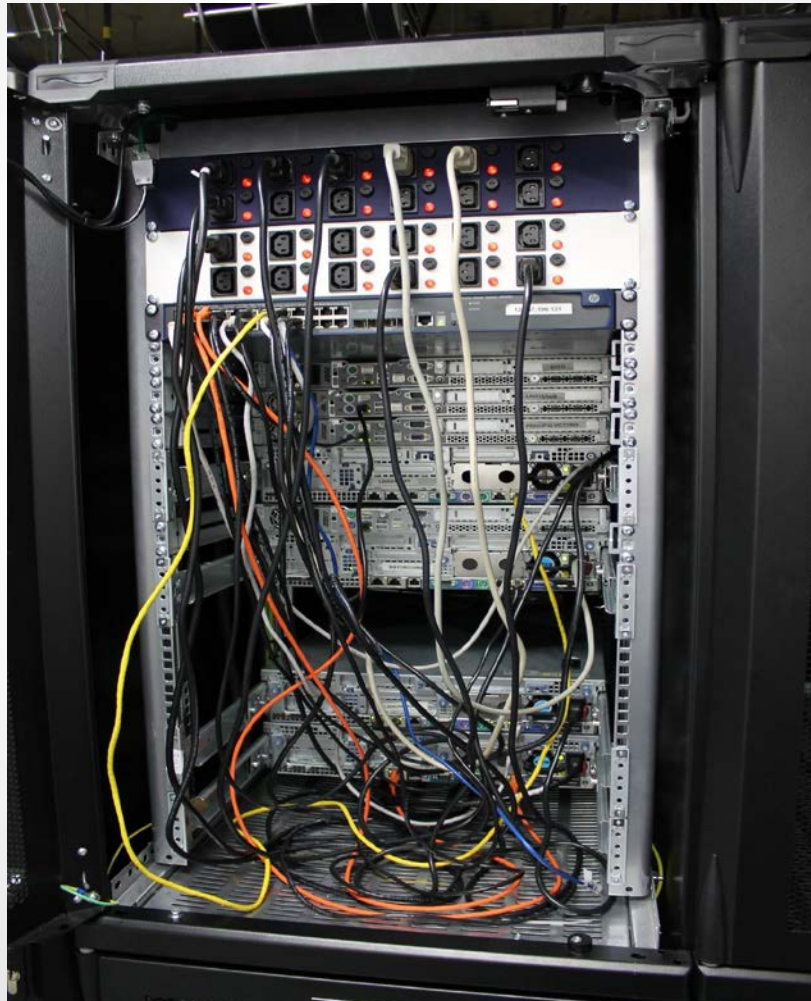
Copying time from local desktop to Win 2008 R2 file server housed in
the USDC

3:40, 3:35, 3:34

1 Year on



1 Year on



What next?

Core relocation

- Move backbone port to USDC
- Main site becomes an annexe
- Firewall and wireless controllers to USDC

Additional benefits

- Extra storage space
- Fewer call outs
- Energy usage reduction
- Extra IPv4 addresses
- Improved security

Why wouldn't you??

Financial incentive

If you sign up for a full, half or third of a rack before 1st August 2013, you can still take advantage of the early adopters discount.

No fee at all in year one and a 50% discount in year two. You pay for the electricity your kit uses x1.5. The extra 50% is to cover cooling costs.

Why not give it a try?

Why wouldn't you??

<http://www.oucs.ox.ac.uk/sis/pricing/>

Data Centre (Colocation) Pricing

(All pricing per calendar month)

Colocation services

Private Rack Rental	£0 (2012/2013 only - usually £150)
Private Half Rack Rental	£0 (2012/2013 only - usually £95)
Private Third of a Rack Rental	£0 (2012/2013 only - usually £70)
Per rack unit (U) in a shared rack	£0 (2012/2013 only - usually £10)

Electricity usage charged back at 1.5x supply price to cover additional cooling costs.

For reference: July 2011 supply price was 8.9p/kWh

Why wouldn't you??

<http://www.oucs.ox.ac.uk/sis/pricing/>

Co-location Introductory Offer

For early adoptors of the USDC (before 1st August 2013) we are offering the first years usage at just the cost of electricity used by your equipment. For the second year pay just your electricity bill and get your base/cooling costs at half price. Please email sis@oucs.ox.ac.uk for further details.

Why wouldn't you??

<http://www.oucs.ox.ac.uk/sis/pricing/>

Co-location Pricing Examples

Below are a collection of example uses of the USDC and the monthly costs associated. All energy usage has been costed at 9p per kWh.

We do not charge setup fees, network connection fees or bandwidth charges. We only charge for the space used, power consumed and power used to cool equipment.

Specification	USDC Year 1	USDC Year 2	USDC Year 3 (Normal)	Standard Server Room (power-only)	Inefficient Server Room (power-only)
Full Rack (High Power 7kW)	£470	£660	£850	£940	£1170
Full Rack (4kW)	£270	£410	£550	£535	£670
Half Rack (2kW)	£135	£220	£295	£270	£335
Third Rack (1.5kW)	£100	£160	£220	£200	£250
Single 2U Server (0.5kW)	£35	£55	£70	£70	£90

For comparison we have included the electricity cost of running the same equipment in an average server room (PUE of 2) and an inefficient server room (PUE of 2.5).

Why wouldn't you??

Stick a DR box or backup server in your shiny new, free rack and have a play.

If you don't like it, speak to the team and tell them why not:
sis@it.ox.ac.uk

If you still don't like it, take your kit out.

IT Services will even help you physically move your kit (in the luxurious IT Services Mondeo Estate).

Alternatively, parking can be arranged for you on site.

What we've covered

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Questions?

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