

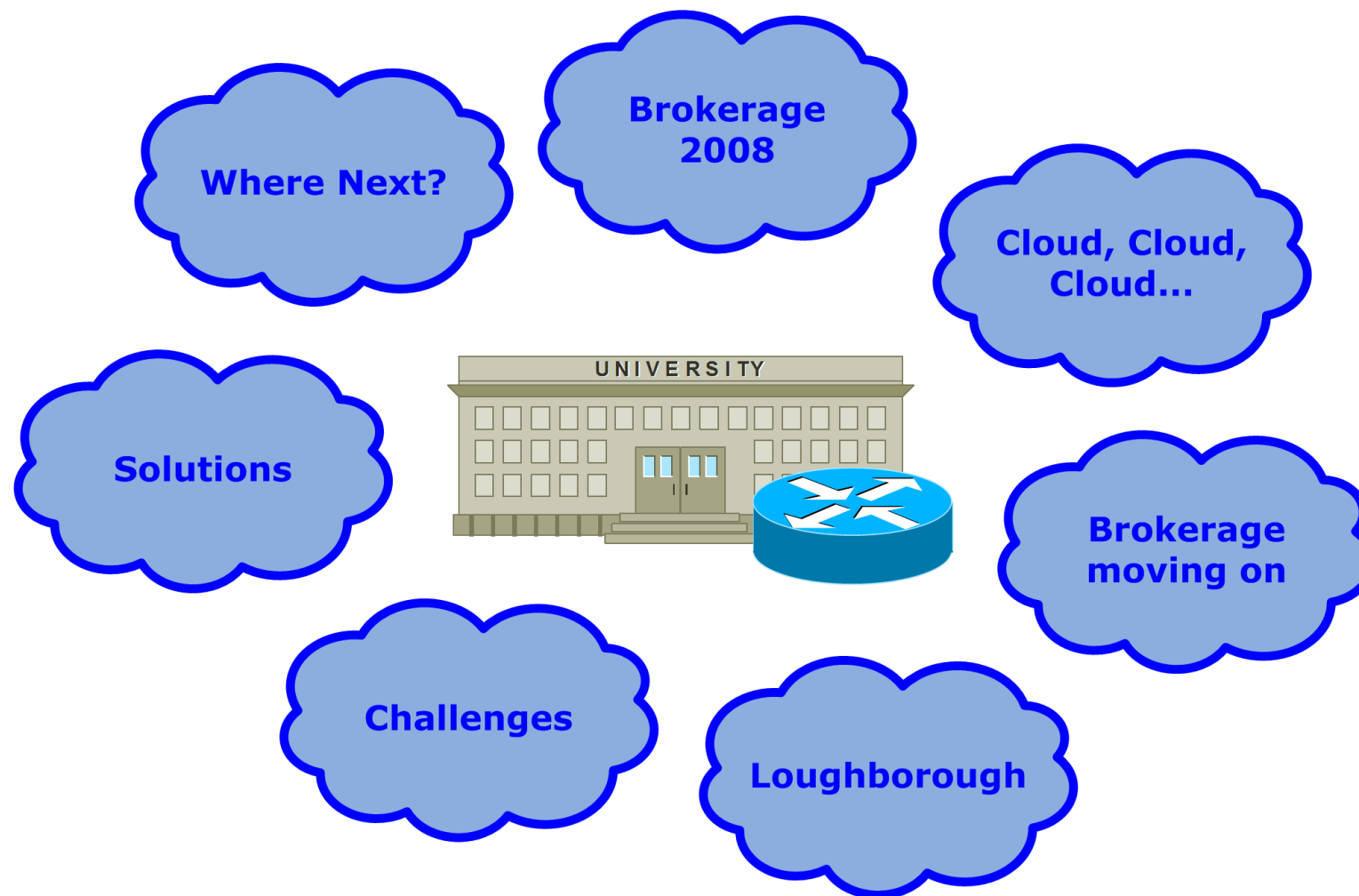
Cloud Computing, an IaaS Reality [JANET Networkshop 39]



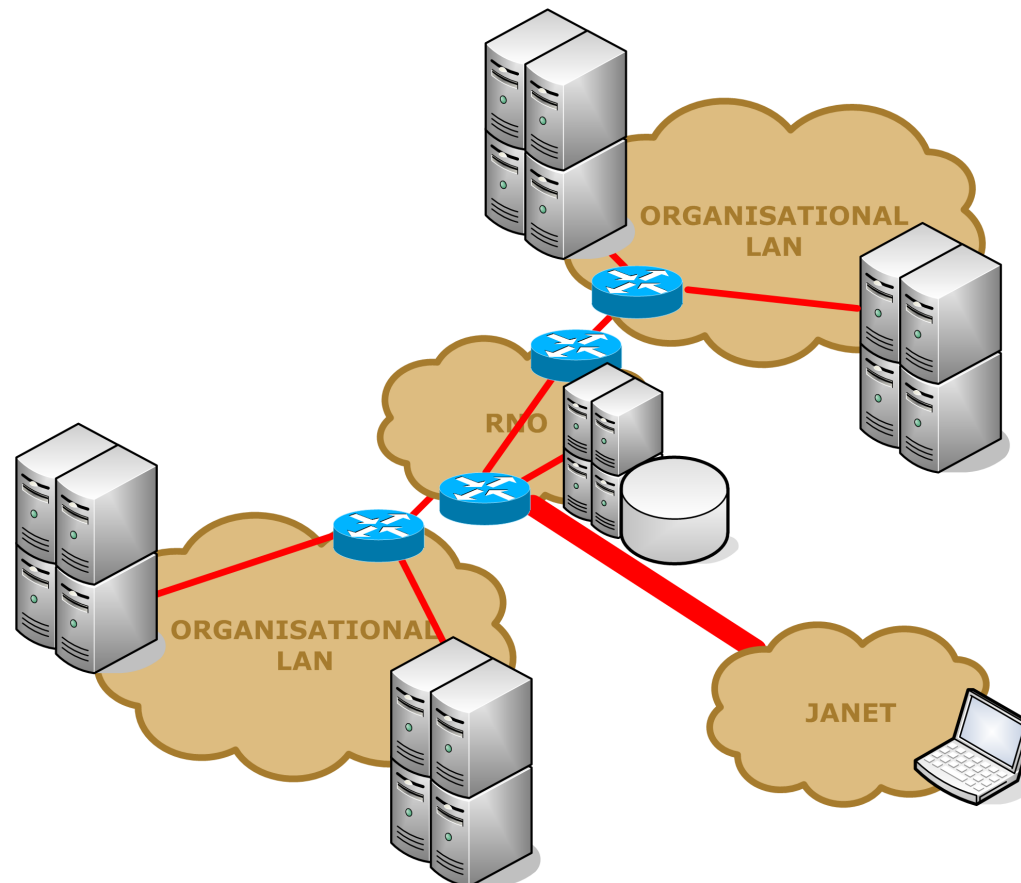
Matthew Cook

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Implementing IaaS Cloud Computing Solutions



Thinking at Networkshop 2008, Strathclyde



However, things moved on and Cloud Computing became...

...the buzzword of the last few years!

Presentation included:

<<http://www.dilbert.com/strips/comic/2011-01-07/>>

Dilbert cartoon licensed for this presentation (license #2213471)

Brokerage moving on through 2009/2010/2011

- In 2009
 - HEFCE Shared Services funding “Shared Data Centres”
- In 2010
 - Loughborough OJEU Competitive Dialogue Tender
 - Talking to JANET(UK) about requirements
- In 2011
 - HEFCE announces in February, JANET(UK) will manage a new brokerage service through UMF funding (circa £5.1m)
 - JANET(UK) providing technical and professional aspects
 - The JANET network, a national grid for cloud!

Cloud Computing at Loughborough University

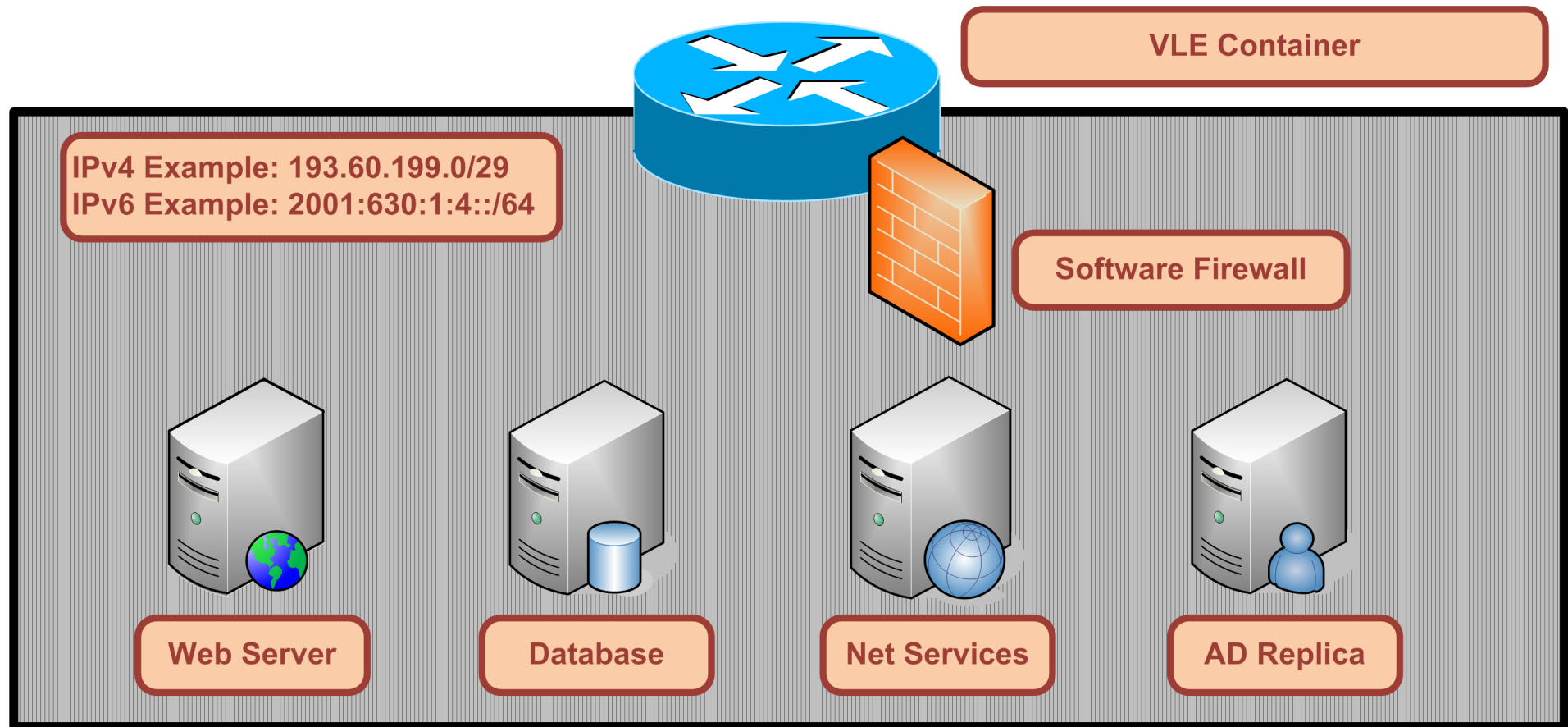
- Implementation of a hybrid cloud, summer 2011
- Primarily for on site virtualisation environment
- Facilities for off site IaaS provision
- Successful migration of a small container of services, summer 2011
- Migration using IPv6 first, then using IPv4 later



Networking Challenges

- How to present IP space in different locations
 - Virtualisation layer 2 adjacency problems
 - Cisco OTV, MPLS, VPN, GRE tunnel
 - This may create a resilience on the main organisation
- Creating a free standing container of resources
 - Extending the security boundary from your LAN
 - Cloud Security Paper from SurfNet (in Dutch!)
 - Making the container self sufficient
 - How to address your container when it moves

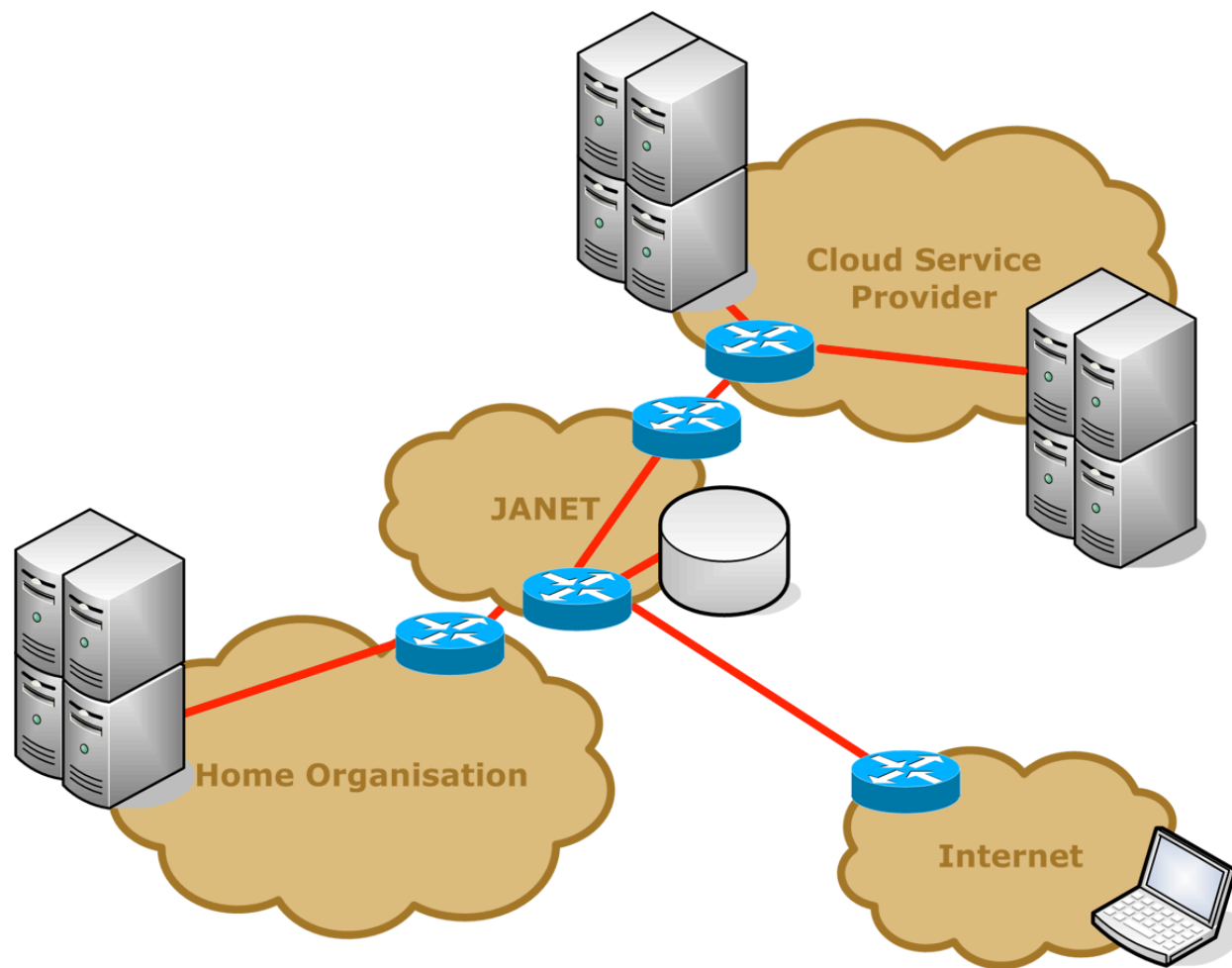
Container



Routing Challenges

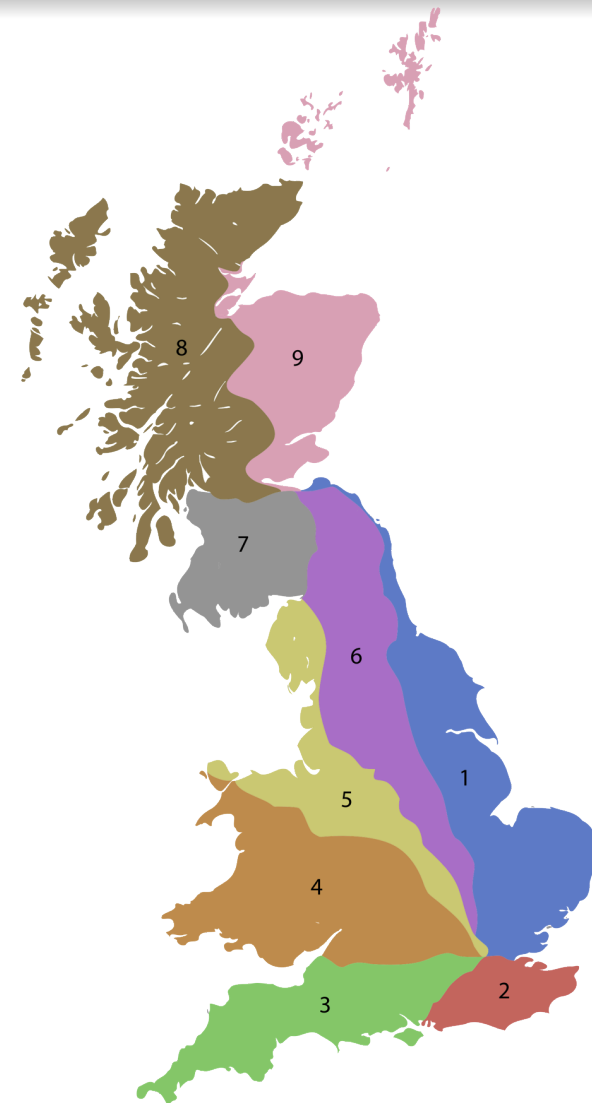
- How to move the container?
 - Sites apply for, or use a spare small IPv4 prefix
 - Sites apply for an IPv6 /64 range
 - Regional network (or JANET) advertises more specific route for a subset of a range
 - Sites split their prefix into more specific routes (Very Messy!)
- Depending where the route is advertised, make sure users on campus and within the regional network can still access the range.
- A new RFC to introduce routing metrics based on application load and other service statistics.

Challenges



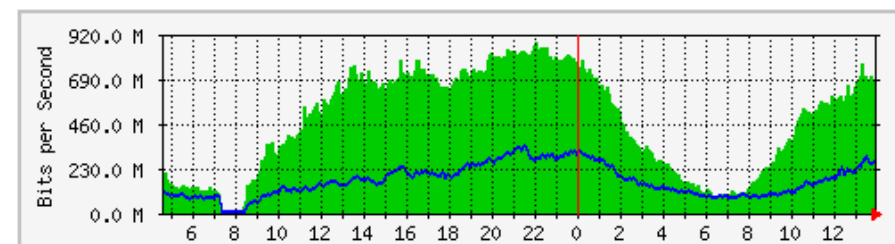
It is a lot easier with IPv6

- IPv4 routing is a mess
- IPv6 is a chance to use contiguous ranges for route aggregation
- UK Trunk Road analogy
- Similar schemes adopted by JANET(UK) and organisations
- Routing IPv6 by region
- It is easier to use a discrete (location independent) IPv6 range
- Location Independent IPv6 /64 for datacenter range



Where next

- Implementation over summer 2011
 - Combined with a £4.2m network refresh
- Providing input into JANET(UK) brokerage
- Watching what else happens in the sector
- Watching how it affects the network
 - Google Apps for students,
increased bandwidth use...



	Max	Average	Current
In	882.0 Mb/s (88.2%)	468.8 Mb/s (46.9%)	685.5 Mb/s (68.5%)
Out	345.4 Mb/s (34.5%)	164.7 Mb/s (16.5%)	258.7 Mb/s (25.9%)

Thank you for listening...

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Questions