NETWORKSHOP 42

AT LEEDS UNIVERSITY

1–3 APRIL 2014

Computational and network challenges for large scale high resolution weather modelling in the WISER (Weather Impact Study at Extreme Resolution) project.

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NCAS, University of Leeds, UK

Greg Holland, Cindy Bruyere, James Done
NESL , NCAR, USA

And contributions from many others including the Met Office and BADC

Summary

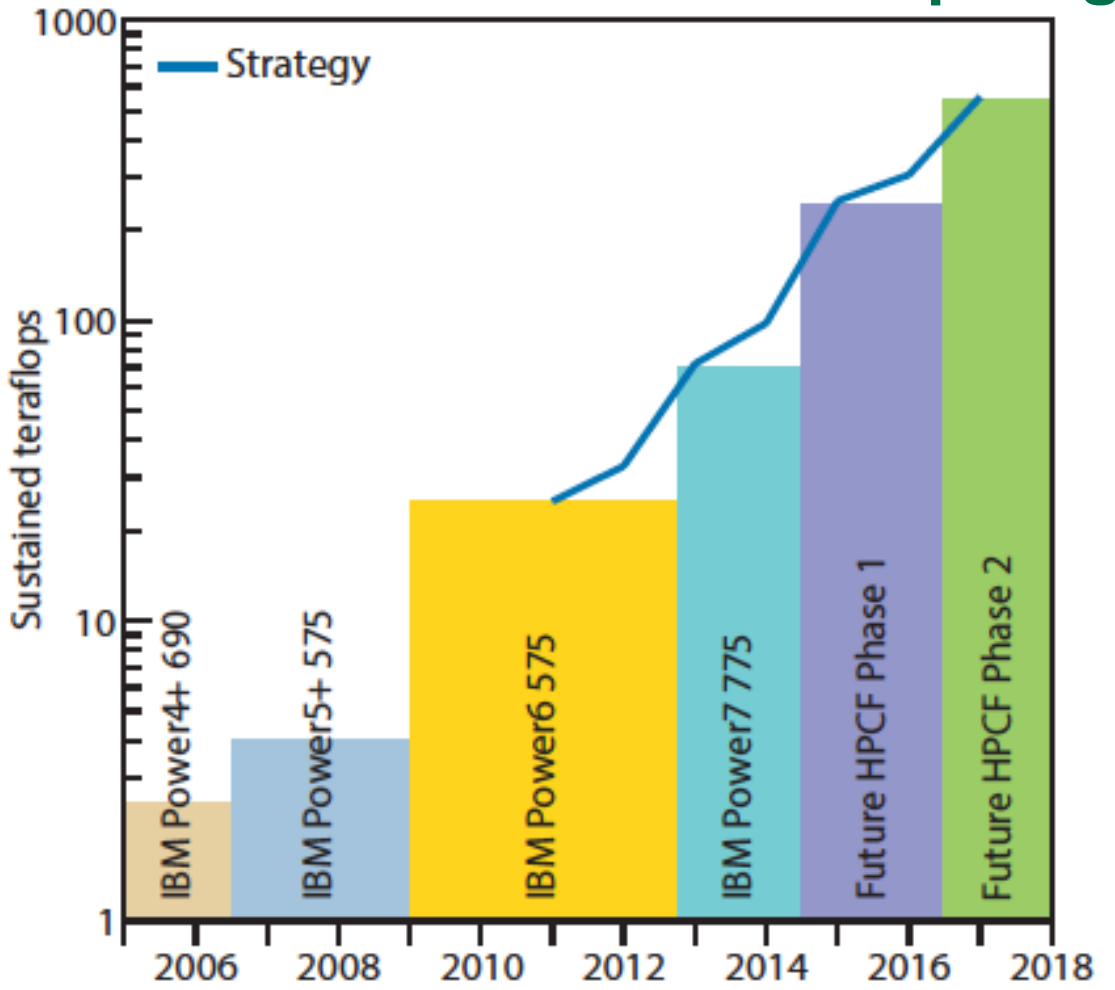
Abstract:-

Weather and Climate Modelling world-wide is a significant user of computational resources. Not only do Numerical Weather Prediction Models (NWP) require vast numbers of FLOPS as scientist try to increase the number of grid points (i.e. resolution and hence accuracy of the modelling) but they also require large amounts of internal data transfer and storage. FLOPS are free is the current mantra in the NWP world.

This talk will illustrate the challenges for one such project, WISER (Weather climate change Impact Study at Extreme Resolution) and how important data transfer and manipulation has become.

The issues facing the Next Generation Weather and Climate codes will be illustrated by reference to current developments in the UK (Gungho project) and other codes (e.g. US MPAS project)which take advantage of massively parallel computers.

ECMWF – computing strategy



HPCF capacity at ECMWF. *The blue line illustrates the computing capacity required to implement the strategy, expressed in sustained teraflops. The coloured bars show the resulting requirements for the replacement HPCF from mid-2014 and the historical evolution of HPCF performance.*

European Centre fro Medium Range Weather Forecasting Centre (ECMWF) has traditionally one of the biggest computational facilities in the UK.

It has recently taken delivery of two CRAY XC6 machines, each machine slightly larger than ARCHER.

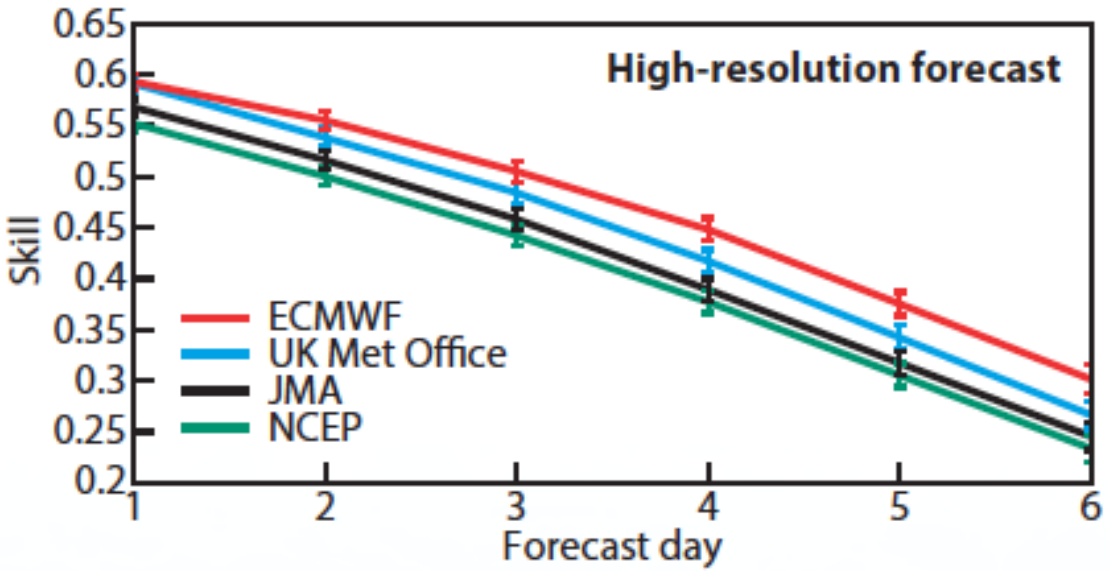
Some would argue that ECMWF produces the "best" and highest resolution forecasts in the world. It is definitely one of the top five in the world, and is used for this talk.

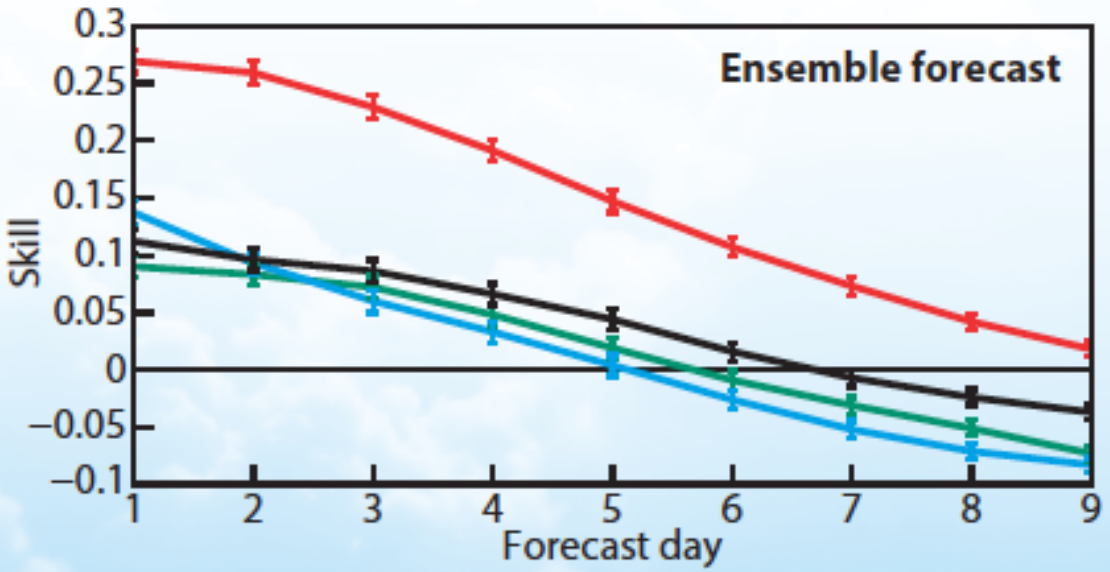
Skill (??) - Forecasting Ability

Comparison of precipitation Forecast Skill for different models. The skill of the high resolution and ensemble forecasts for 2012 for extratropical regions is shown

Bars indicate 95% confidence intervals.

N.B. different models come out better with different metrics





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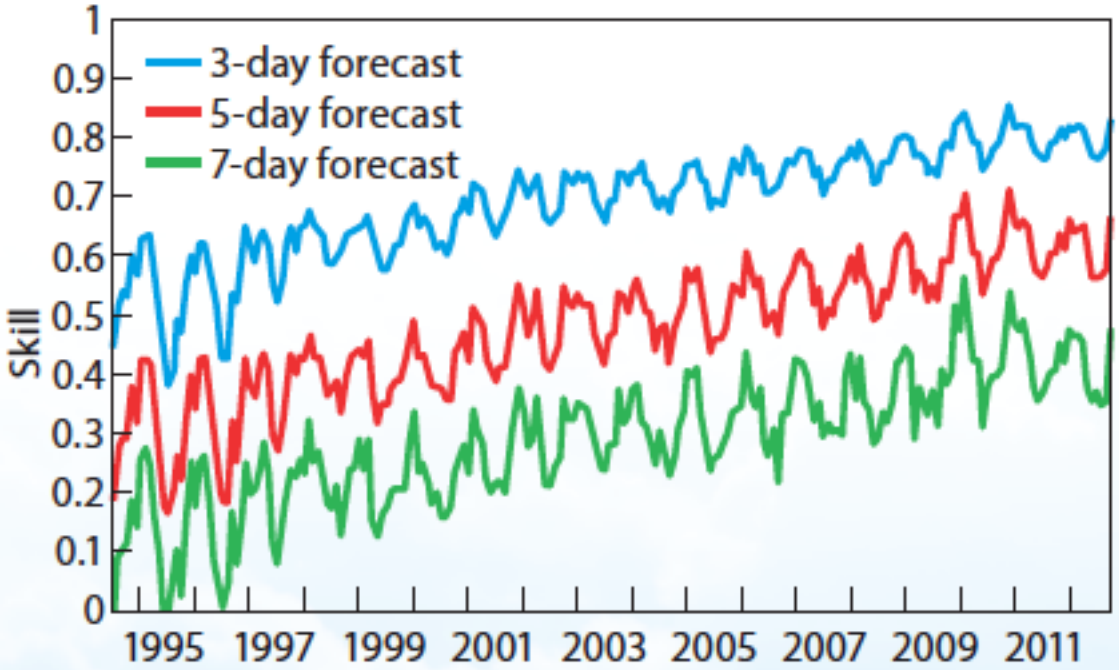
Improvements in Forecasting Skill – ECMWF NWP model

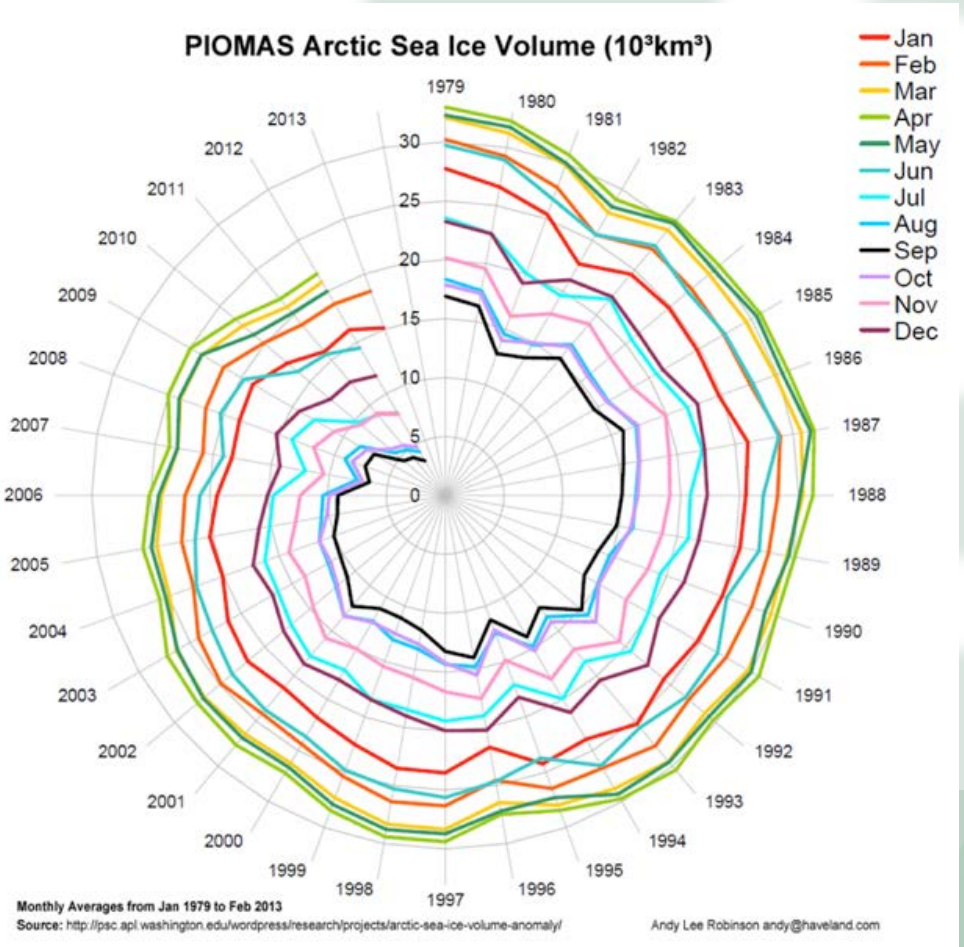


Improvement in the skill of the ensemble forecast. *ECMWF ensemble forecasts are much more reliable and skilful than they were when they were first produced, two decades ago. These results for the 500 hPa geopotential height indicate that for the northern hemisphere extratropics there have been gains in predictability of between one and a half and two days per decade (e.g. the five-day forecast is now as skilful as the three-day forecast in the mid-1990s).*

WISER project

Background.

The earth's weather system, especially in the Northern Hemisphere is now exhibiting serious evidence of severe climate change; changes in "high pressure blocking systems", is resulting in significant warmimg of the Arctic Ice caps. These will arguably disappear (less than 15% broken ice) by September 2016



PIOMAS ice volume for September from 1979 to 2012, exhibiting significant Arctic Ice Loss.

WISER project

Summary.

WISER (Weather climate change Impact Study at Extreme Resolution) is a project designed to use a numerical weather model (WRF), in a channel formulation (Figure1). It is a regional climate model which will complete a global study (driven by ERA-Interim data from 1979-2011) and then for three selected decades in this century. This is a significant computational activity, using the European PRACE computational facility. Relative high resolution is required to resolve meso-scale weather patterns to reducing the errors / upscaling limitations. We will be making this an open dataset. Climate models have insufficient resolution to simulate well "blocking" and regional meso-scale precipitation events which are critical in understanding climate change The basic assumption is that "***Climate is now a weather scale process problem, and simulation of meso-scale processes is required to understand and predict future changes***"

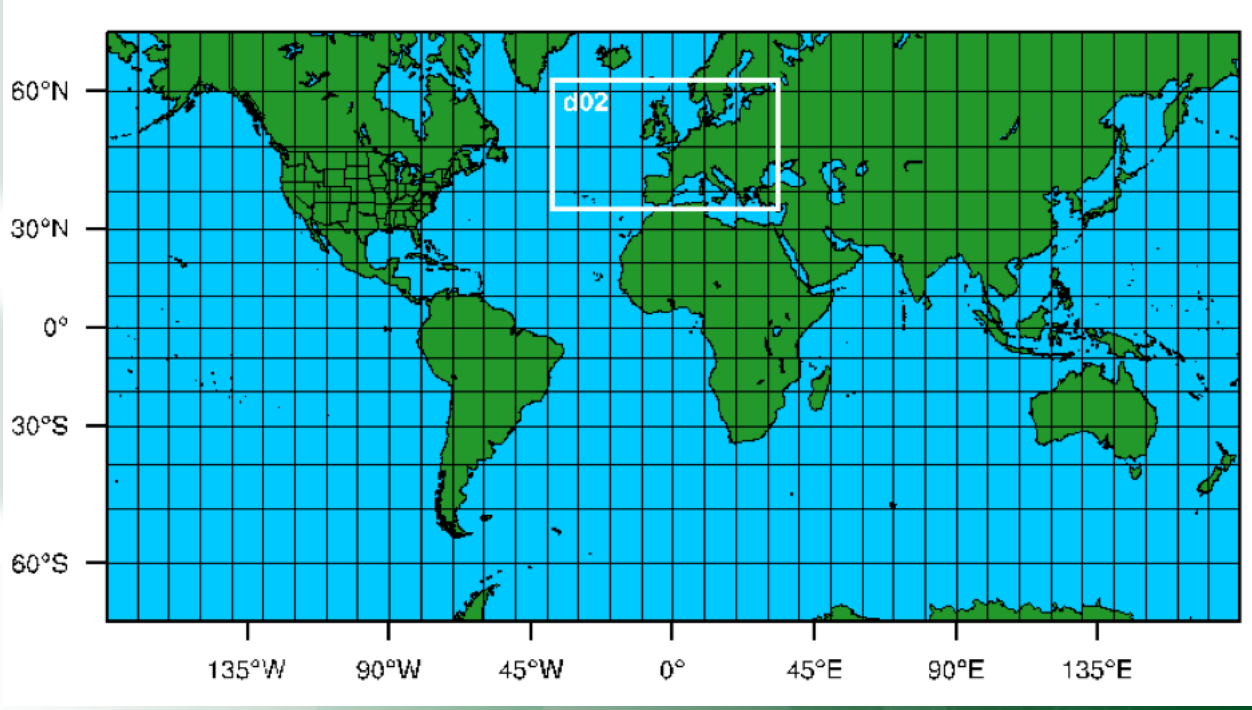


Figure 1. Domain structure for the WISER simulation. Outer domain resolution is 20km at +/- 30^0 N/S and ~ 8km at 68^0N; the inner domain resolution defined as a factor of 5:1 smaller

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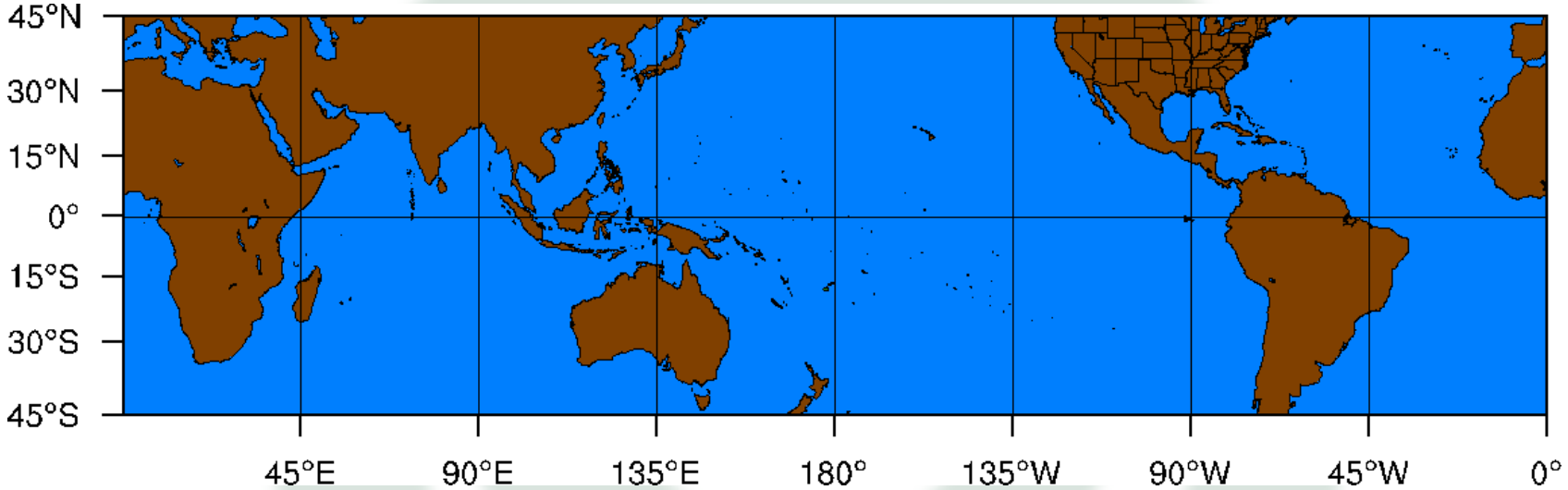
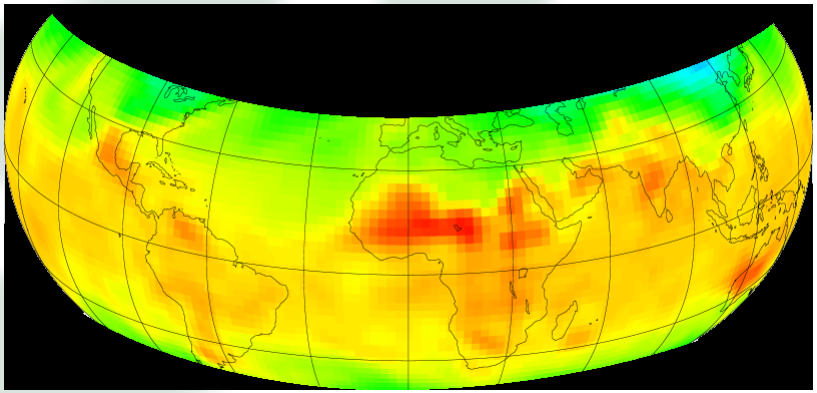
Collaborations

1. National Center for Atmospherice Reasearch (NESL .. Greg Holland, James Done, Cindy Bryere)

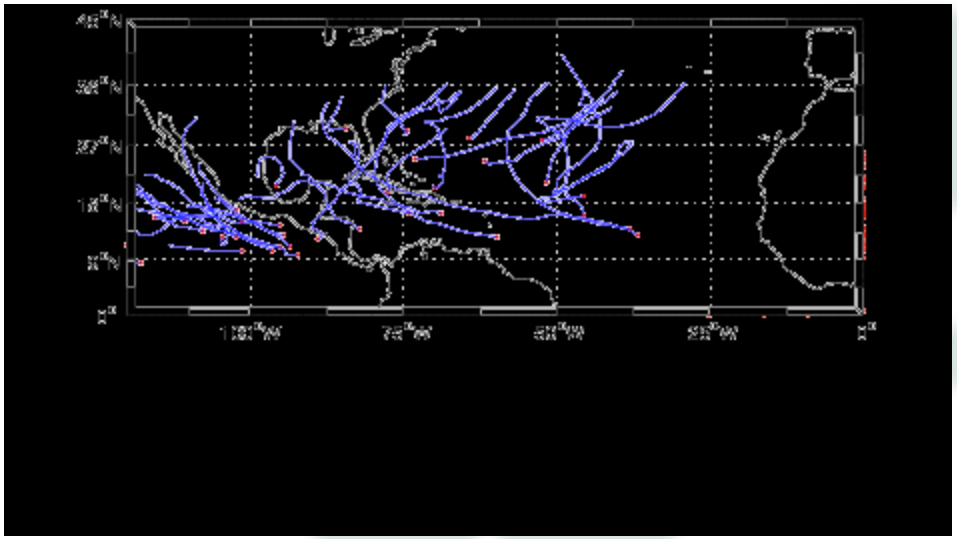


45S - 45N
36 km resolution
51 levels
10 mb TOA

2000 - 2005
Reynolds SST data
Periodic EW boundary



NRCM



36km

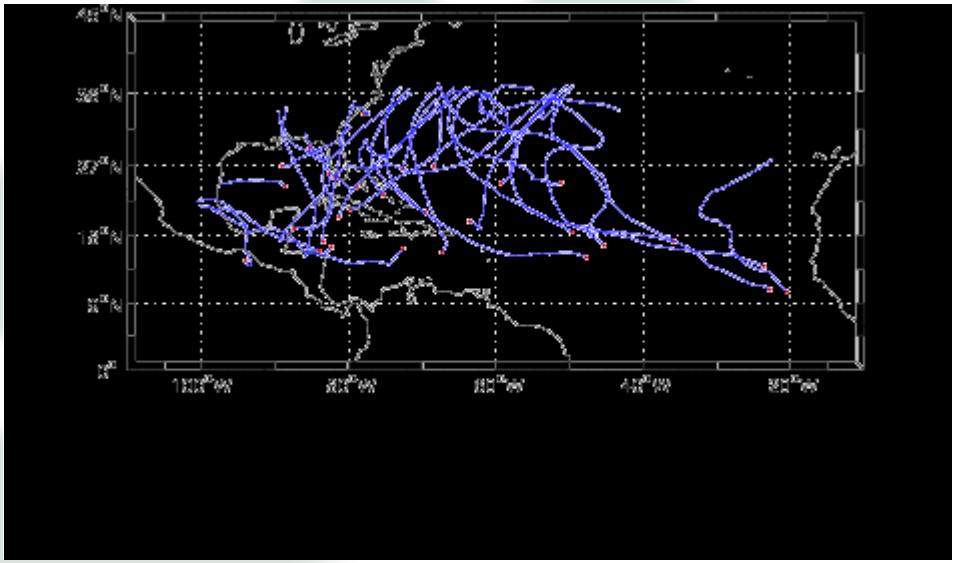
18 storms

12 km nest

28 storms

(27 storms observed)

Asuka Suzuki-Parker



Preliminary results for 10m surface winds

Results from NCAR simulation, for domains of 12km and 36km

A typical weather system pdf

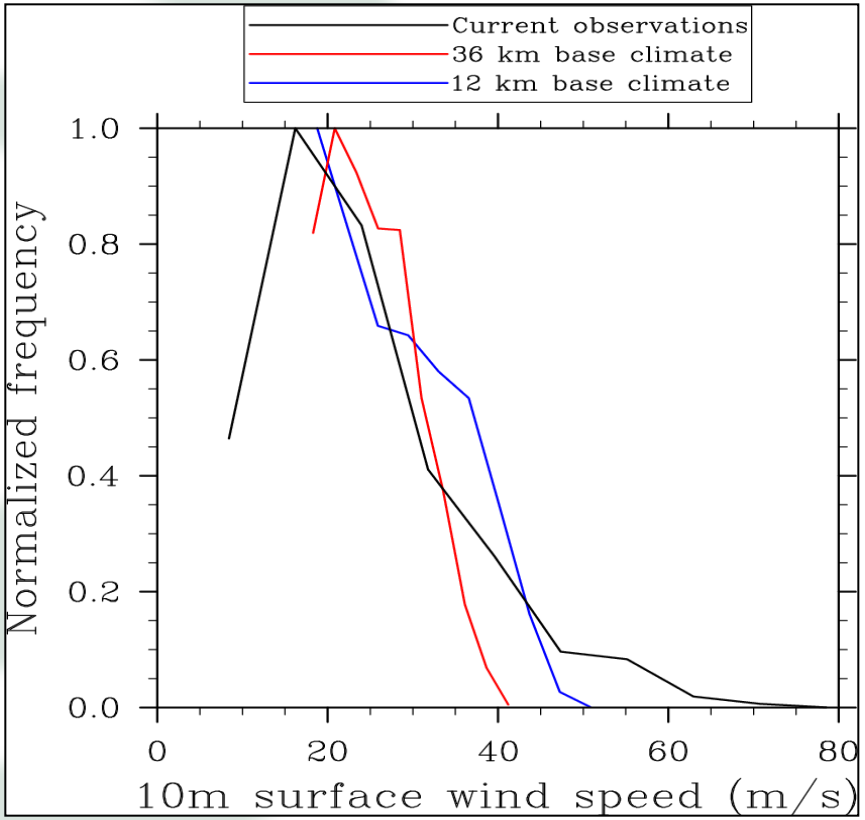
The Problem: Typical regional climate models do not capture the most extreme events observed.

The pdfs are truncated at high end due to:

•resolution – cannot resolve the relevant processes;

• capacity – do not include the relevant processes;

• rarity – cannot be run long enough to sample the tail.



WISER

The proposal is based on 50 year climate simulations. In terms of computational resources, running the global model will require less resources compared to the very high resolution nested regional simulations. Greater than 70% of the CPU time will be used by the high resolution (~4 km inner domain) simulations.

CPU requirements from our present work on the HECToR / ARCHER system suggest about 1.4 MAus for a 24hour wall clock / model month. Each decadal simulation is about ~ 4,096 cores for 120 days. We wish to simulate whole years of the climate at several intervals over the 50 year study.

The total computational requirement is ~ 9×10^8 AU.

A single year's simulation at high resolution will require 25 Tbyte storage. Therefore for the whole project with 20 years of (future) simulation the total requirement is 600 Tbytes.

WISER

Expected Outcomes:

The aim is to establish how storm track behaviour, occurrence of blocking anticyclones and severe precipitation in Western Europe, and in particular the UK, will change over decadal timescales in the modified climate system caused by global warming (A2).

Provisional objectives and specific outcomes:

1.Predicted changes in general precipitation over Western Europe and the UK over decadal times scales.
2.Predicted changes in patterns of frontal tracks on decadal time scales and to examine the strength, the frequency and the location of Western Atlantic storm tracks for historical and future simulations.
3.Past and predicted occurrence of blocking in the North Atlantic
4.Predicted changes in quantity and frequency of severe and hazardous convective rainfall events as above. The frequency of flash flooding due to heavy convective precipitation. Links to be examined to connections with JRC for flooding.
5.PDF of (C.E.T.) temperatures and any other regions of specific examination.
6.Predicted changes in surface wind field distributions at current and planned wind farm sites. As the UK and Europe need to dramatically increase their dependence upon renewable energy sources, such wind speed distributions are crucial for determining the potential yield of wind farms in future climate scenarios for decadal predictions.

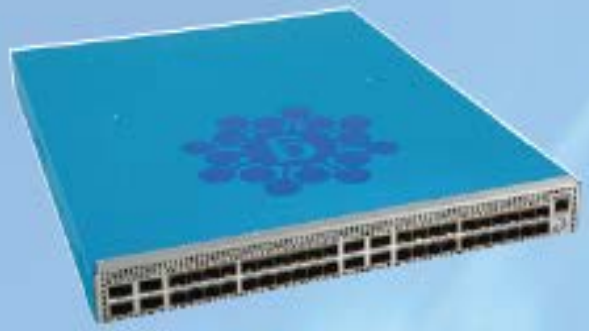
Infrastructure

JASMIN structure (including UK Met Office, JASMIN North and HECToR /ARCHER)

Structure of Network we are using for the project.

JASMIN North at Leeds

The JASMIN facility is a multi-Petabyte "super-data-cluster" funded by NERC and UKSA in 2012 based at the Rutherford Appleton Laboratory. The School of Earth and Environment currently hosts the north satellite of the JASMIN system and is served by a 10Gbps Gnodal private network linking a Panasas parallel storage system to local compute. The supporting network infrastructure includes a Janet point-to-point Lightpath connection from Leeds to the core JASMIN system located at RAL.



gnodal

GS4008 10 and 40 GbE switch

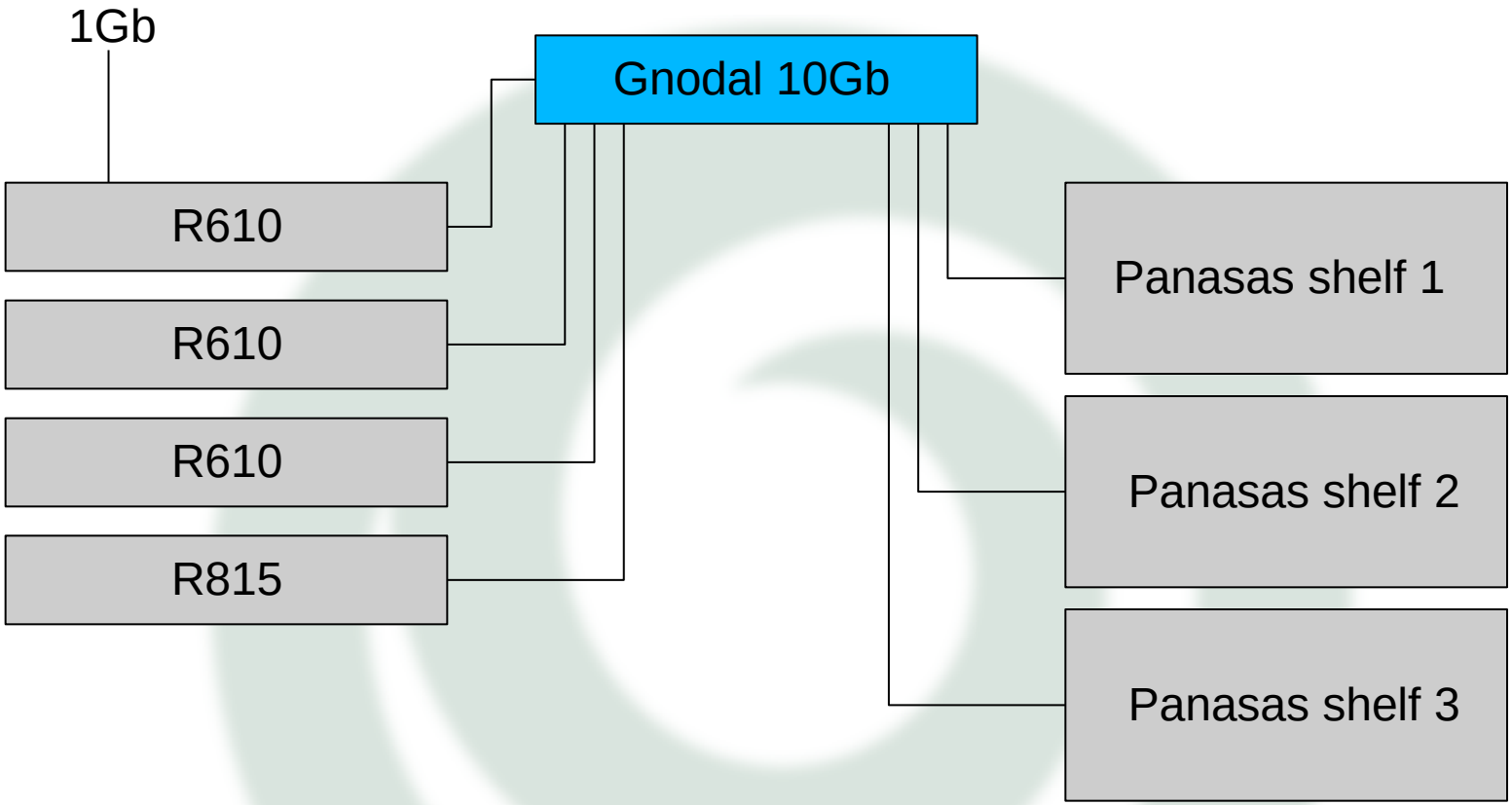
panasas

150Tb Panasas ActiveStor 11

DELL

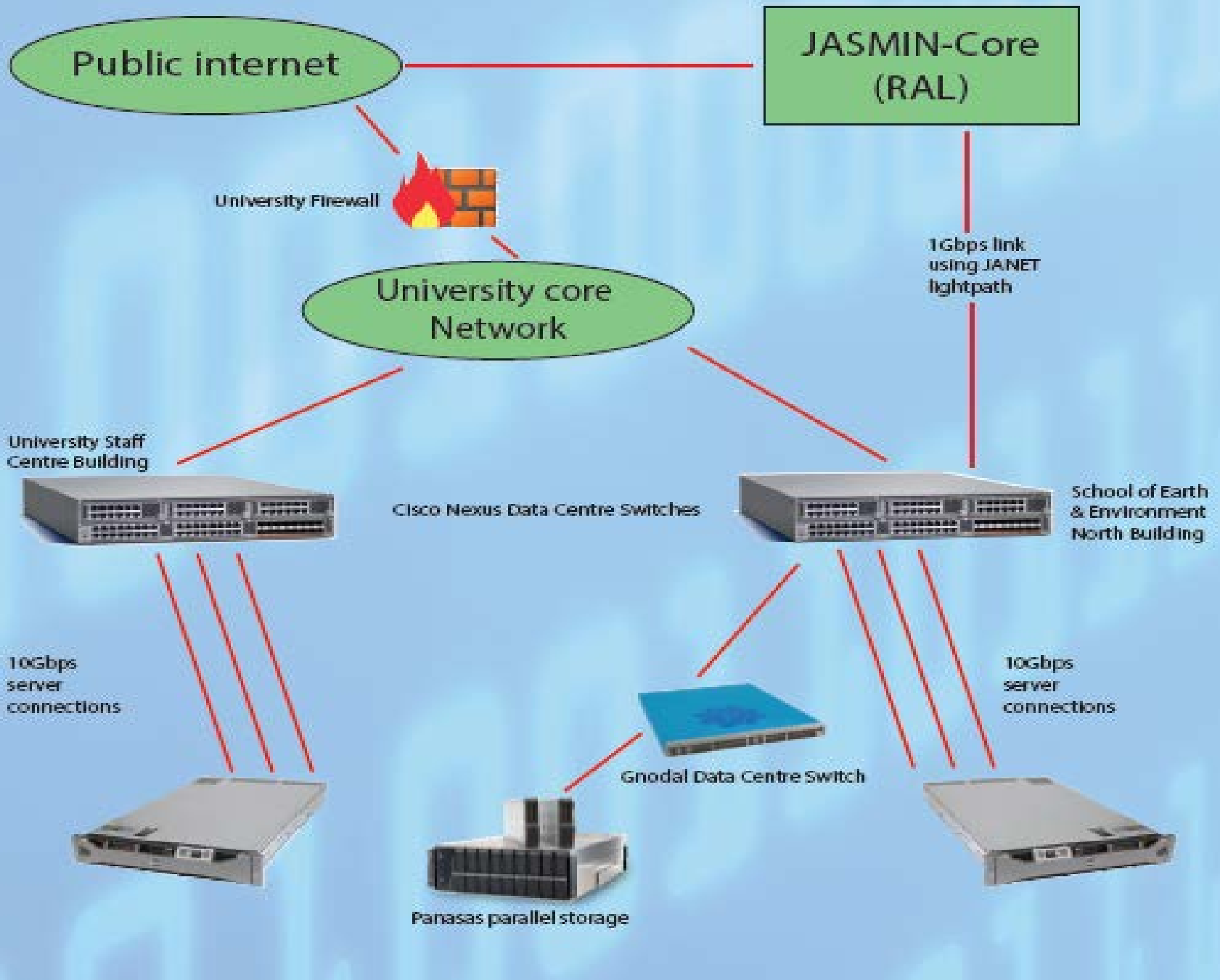
7 X Dell multicore servers

JASMIN North setup



What we currently have setup and running on Jasmin North

- All machines installed with Centos 6
- NIS, dnsmasq, is setup on the one of the R610s this is to act as a gateway.
- NFS and Panfs is setup on all the client machines


Public internet
JASMIN-Core (RAL)
University Firewall
1Gbps link using JANET lightpath
University core Network
University Staff Centre Building
Cisco Nexus Data Centre Switches
School of Earth & Environment North Building
10Gbps server connections
10Gbps server connections
Gnodal Data Centre Switch
Panasas parallel storage

Each server rooms consists of:

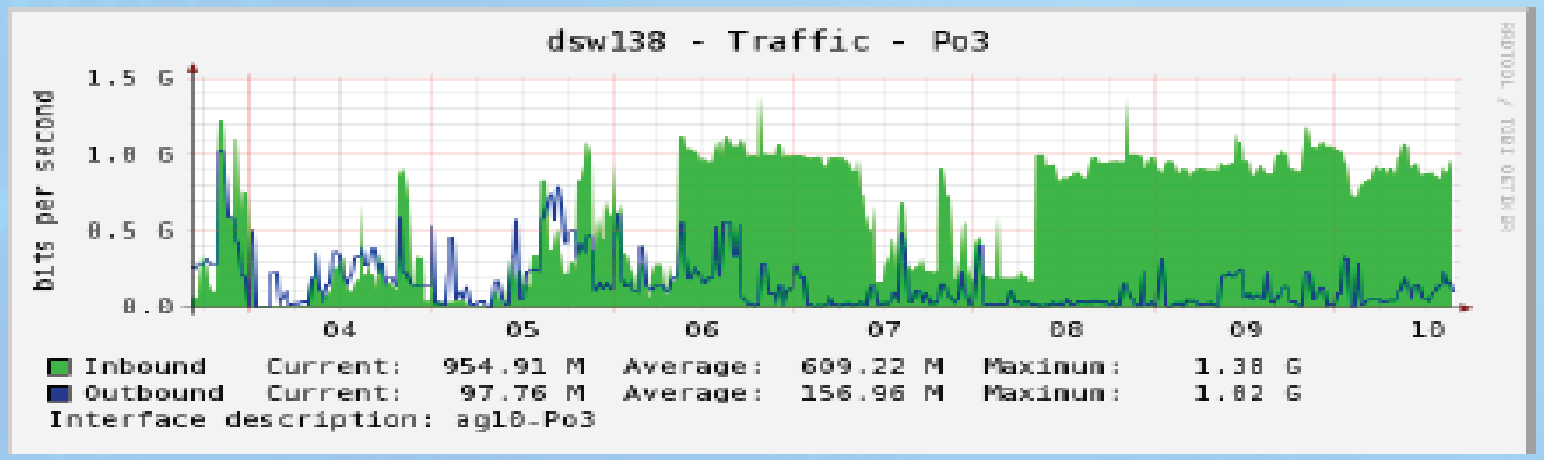
Multiple fileservers providing a total of 1.3Pb of storage. Typical server features:

- Non-proprietary hardware
- Standard Linux OS – no additional proprietary software
- RAID 6 array consisting of 32 x 4Tb SATA disks
- Fast SSD cache
- 10 Gbps network interface
- xfs filesystem
- Data exported via NFS and CIFS
- Thin provisioning

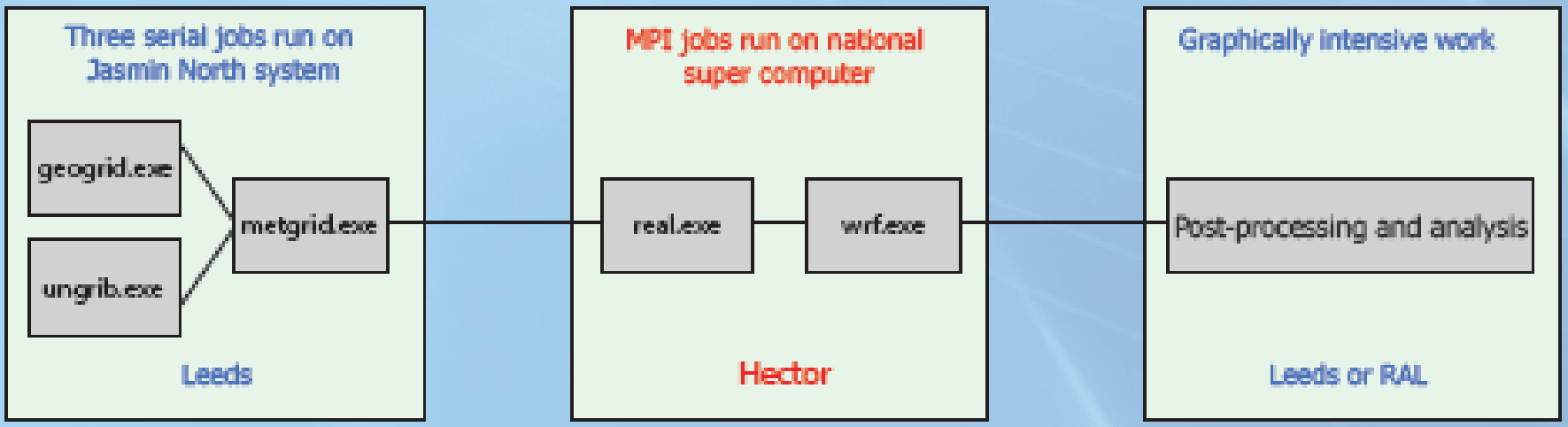
Compute servers with around 700 cores
Cisco Nexus 5596 distribution switch with 48 x 10Gbps ports
2 x 10gbps backbone uplinks

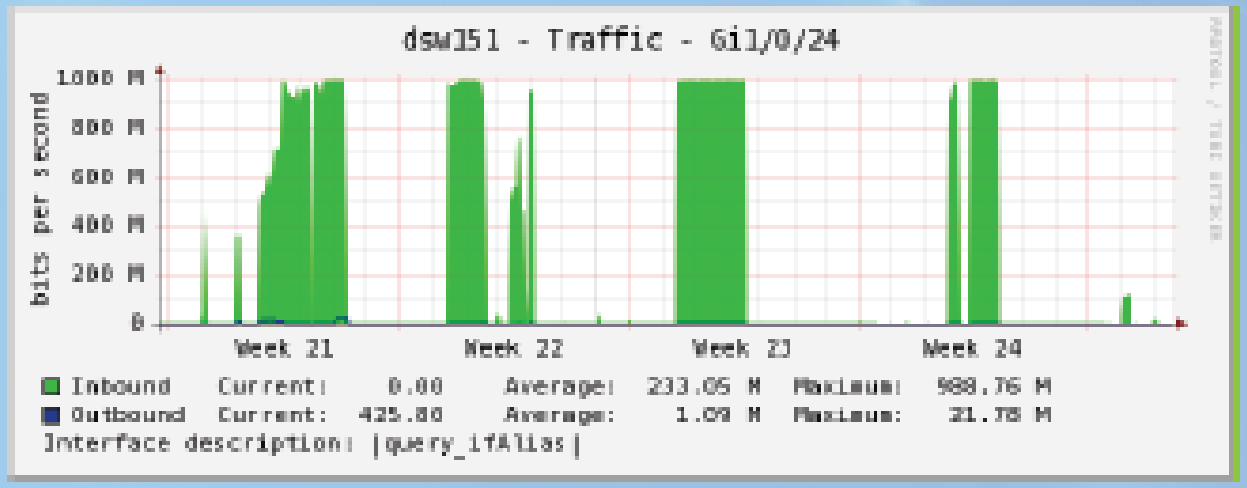
This supports:

Processing of local storage on local compute across the 2 server rooms
Mirror and backup of storage to the second server room
Data transfer to Arc1, N8, Hector, and other national and international sites.
Local archive of data



Work Flow Example for WRF





Network traffic between Jasmin North and Jasmin South over the lightpath.
Tests have shown speeds of around 90Mb/sec transfer rates are achievable.

Challenges

Issues:-

1. Transfer of (CCSM) data files from the US
2. Transfer of data files from Archer and RAL
3. Poor client performance on the R815
4. Network speed Issues in and around campus

In the background, there is the continual challenge to do the basic data cpu processing (FLOPS).

Also WATER!

Next Generation Weather and Climate Programme

What is NGWCP?

- There is a huge need for higher resolution modelling capability for climate and weather to help improve both our understanding of the multi-scale processes in the atmosphere and oceans, and further increase the accuracy of forecasts. (e.g. MPAS & DWD)

- It a collaboration between the Met Office, STFC (Science & Technology Facilities Council) and a team of UK academics to explore the methods appropriate to building a unified weather and climate forecasting model for the future. NERC funded. 2+3 year project. See the web page:- http://www.nerc.ac.uk/research/programme/ngwcp/

- Arguably one of the biggest challenges facing the future of UK MO NWP and Climate Prediction, one which could have the most significant effect on the Physics within the NWP model, and possibly one of the biggest challenges for UK MO / University / STFC partnerships.

GungHo! (working together harmoniously)

Globally

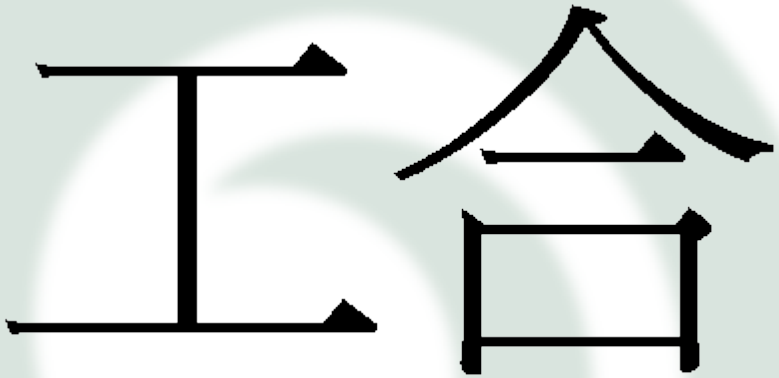
Uniform

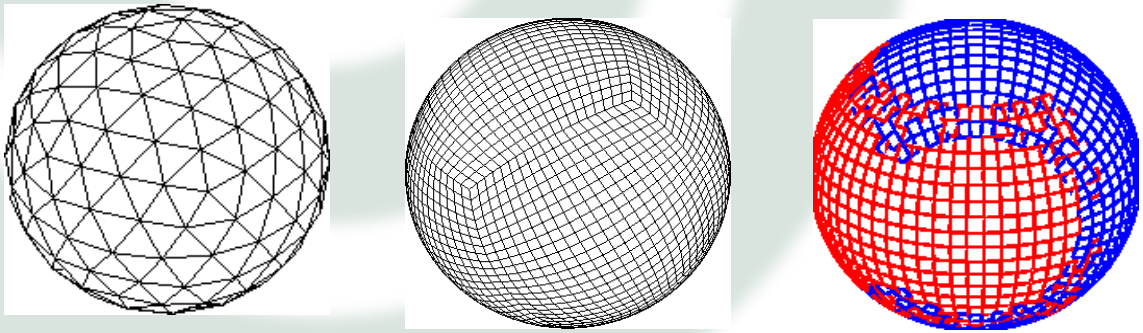
Next

Generation

Highly

Optimized





NERC, MO and STFC working together

NWP -- CHALLENGES

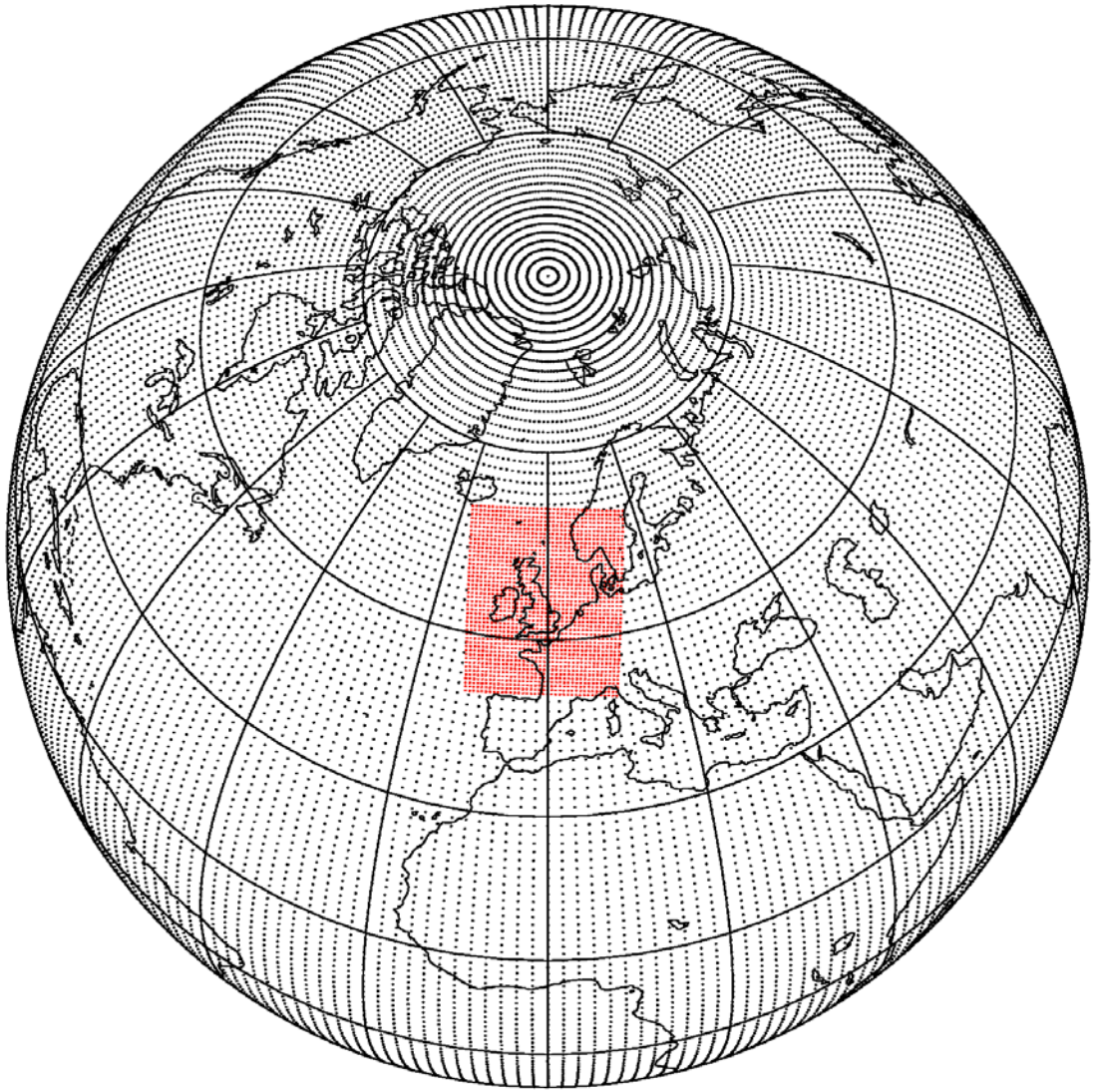
The challenges are for future models with higher resolution grids.

The current use of grids based on lines of latitude and longitude causes problems for efficient communication in massively parallel computers

- grid-points converge at the poles, acting as a barrier to moving to massively parallel computers.
- how to approach the need for higher resolution models and, in particular, whether global models with more coarse resolution can accurately support embedded regions of higher resolution
- how to improve parameterisation schemes to reflect the higher resolution of the underlying dynamics.

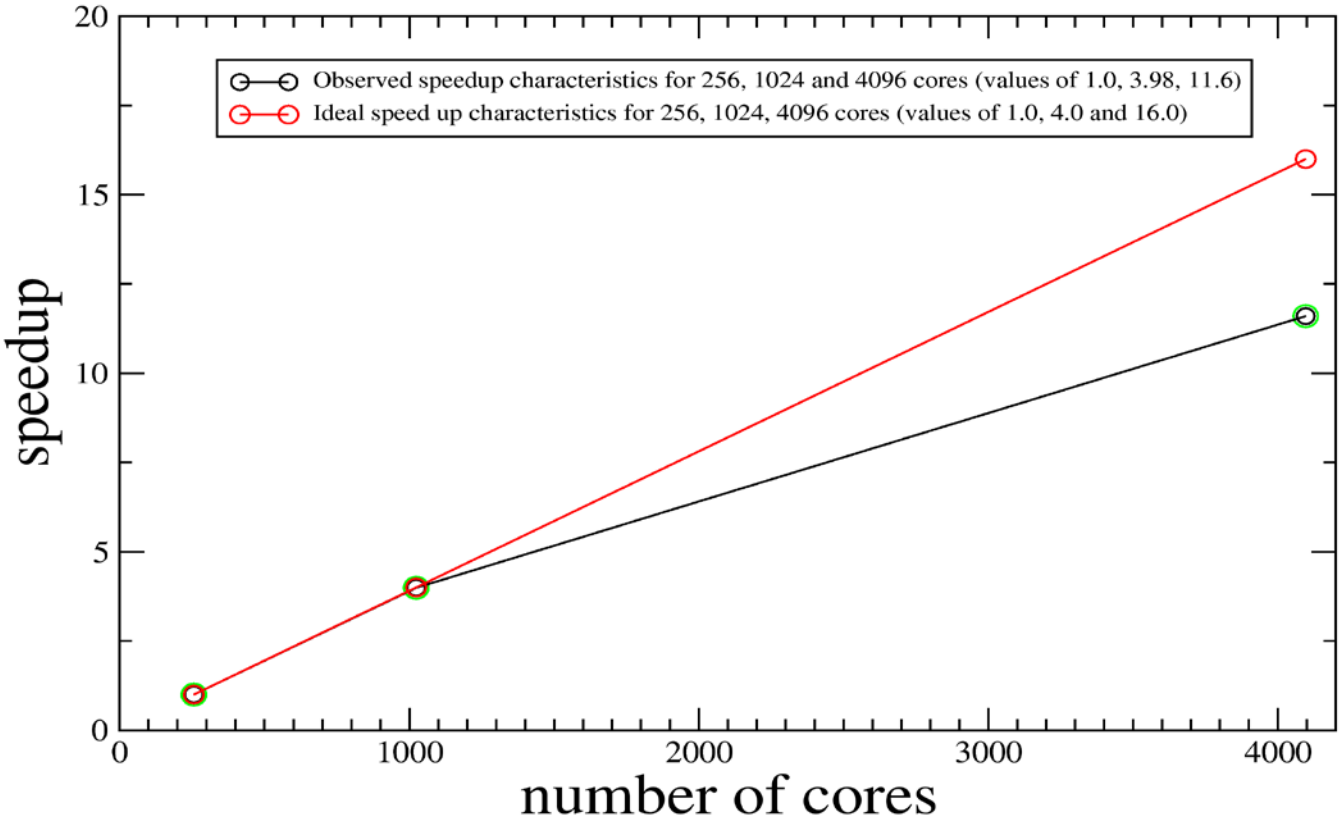
Grid points converging at the poles require polar filters, limit time steps with associated CFL and semi-lagrangrian time step issues. These can be avoided by constructing a grid that covers the globe with approximately uniform grid-boxes, but what about the equations / process and physics' processes? What about the baby as we throw out the bath water?

Grid point convergence at the poles



For a global 7km model, which is the resolution ECMWF are working towards, this means 10 m resolution near the poles. In a finite difference grid point model there will be a consequential small time stepping limit in the polar regions.

Parallelisation Challenge (WISER as an example)



Graph of number of cores (abscissa) vs Speedup (ordinate). The speed up was defined as 1.0 at 256 cores. For 1024 cores the speed up was 3.98 and for 4096 cores, the desired configuration, the speed up was 11.6 (an efficiency of 73%) . The inner domain speed up was ~ 94%. These results were calculated without i/o. These calculations were computed on ARCHER, and an average model day took 0.71 +/-0.02 hours (1 SD).

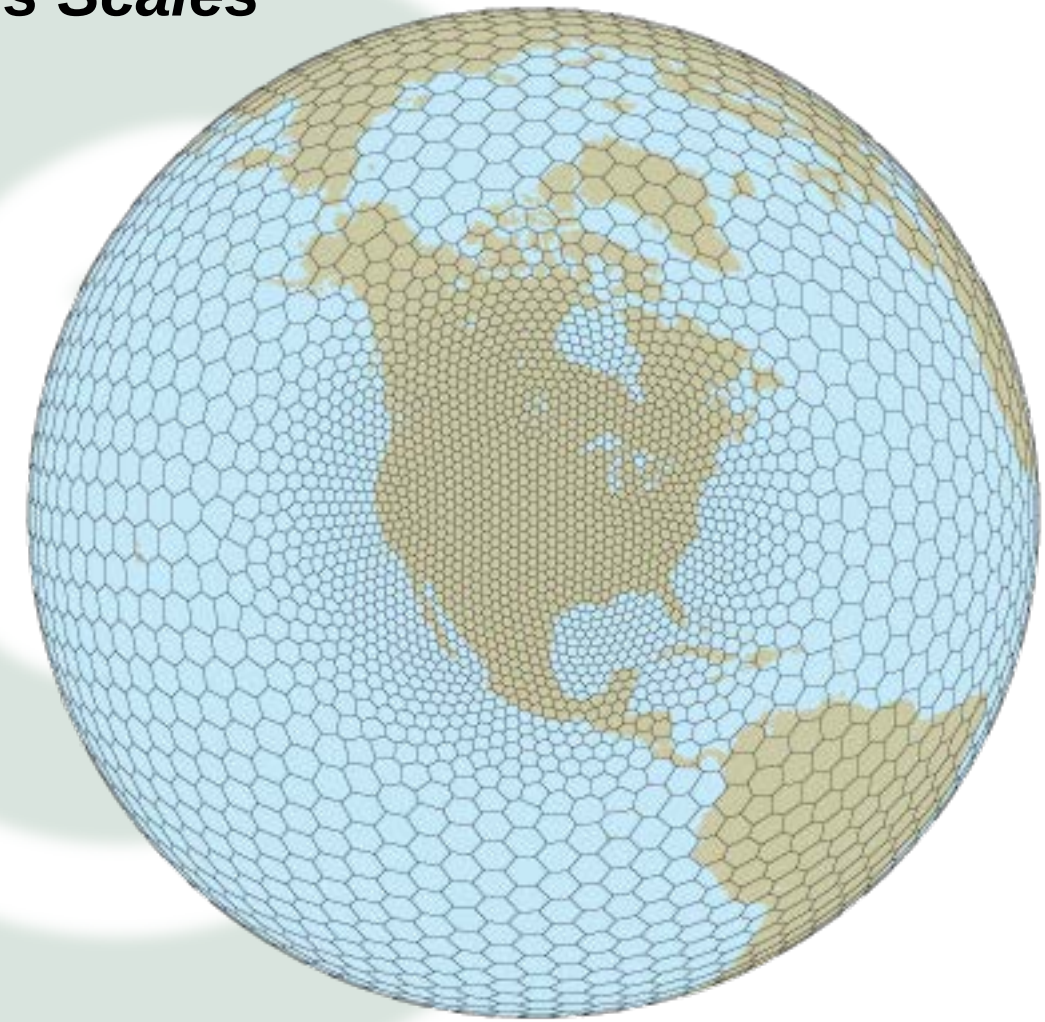
US (National Center for Atmospheric Science) MPAS model

Model for Prediction Across Scales

The atmospheric component of MPAS, as with all MPAS components, uses an unstructured centroidal Voronoi mesh (grid, or tessellation) and C-grid staggering of the state variables as the basis for the horizontal discretization in the fluid-flow solver.

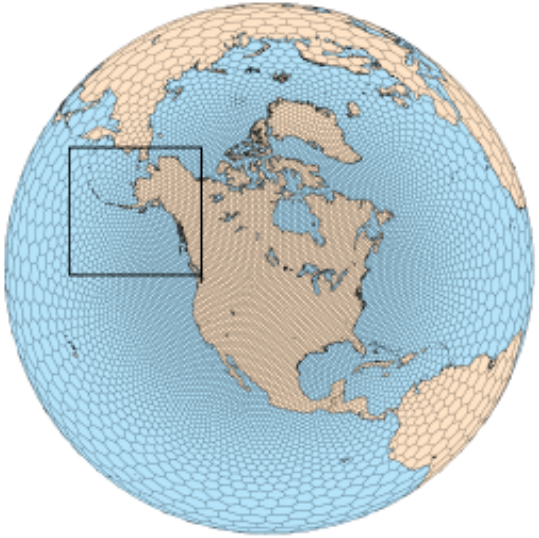
The unstructured variable resolution meshes can be generated having smoothly-varying mesh transitions (see the figure to the right).

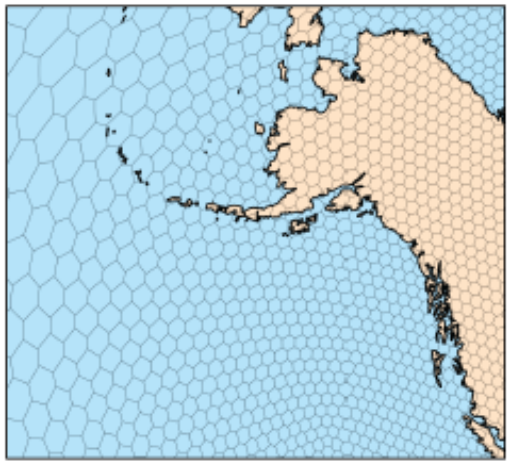
The MPAS atmosphere consists of an atmospheric fluid-flow solver (the *dynamical core*) and a subset of the WRF model.



MPAS
Model for Prediction Across Scales

MPAS-Atmosphere





Unstructured spherical centroidal Voronoi meshes

Mostly *hexagons*, some pentagons and 7-sided cells.
Cell centers are at cell center-of-mass.
Lines connecting cell centers intersect cell edges at right angles.
Lines connecting cell centers are bisected by cell edge.
Mesh generation uses a density function.
Uniform resolution – traditional icosahedral mesh.

C-grid

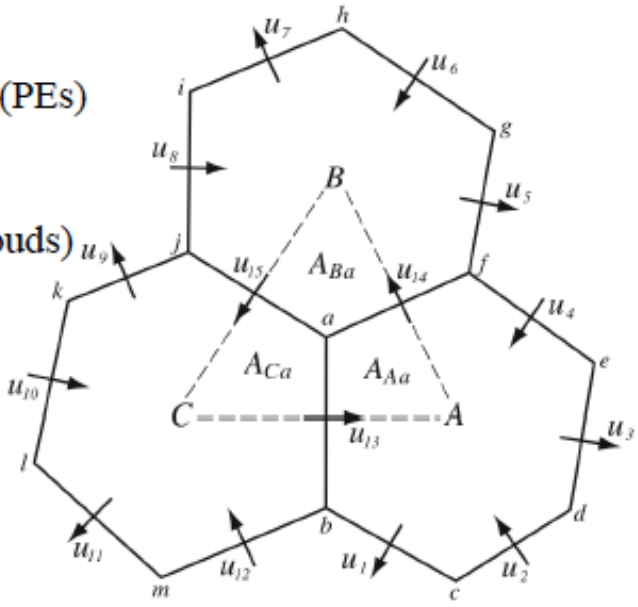
Solve for normal velocities on cell edges.

Solvers

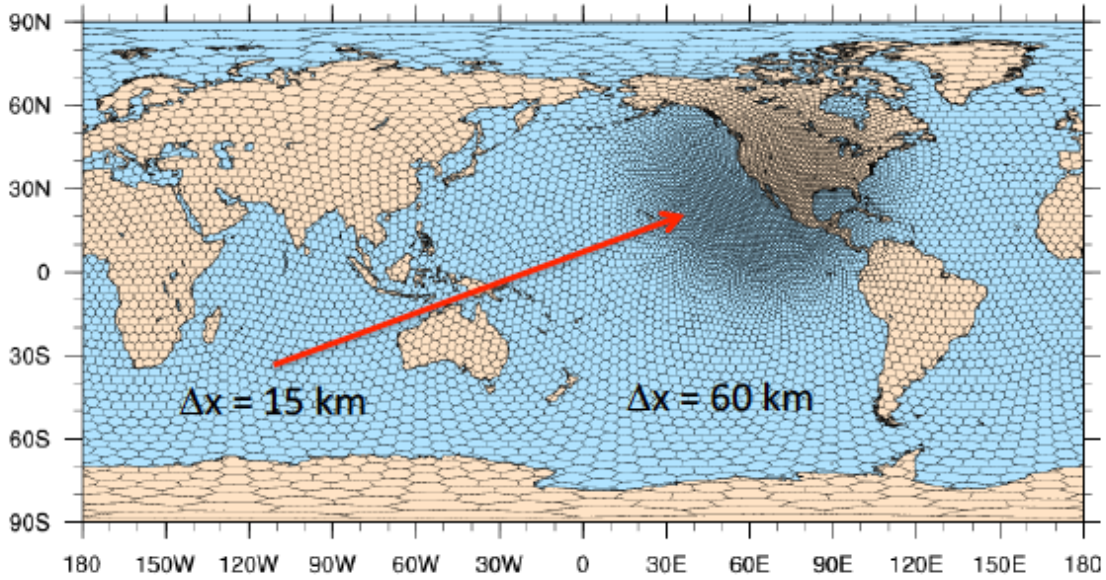
(1) hydrostatic equations (PEs)
(2) Fully compressible nonhydrostatic equations (explicit simulation of clouds)

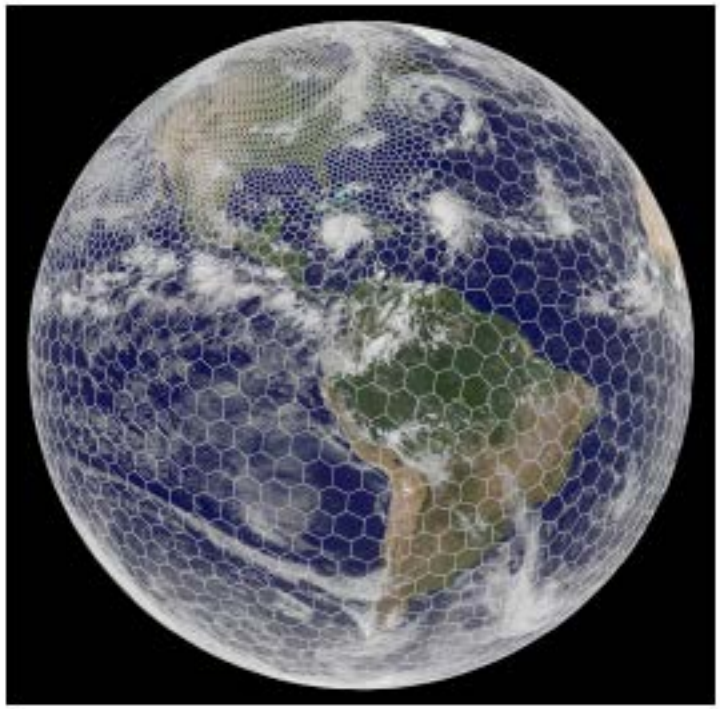
Solver Technology

Integration schemes are similar to WRF.



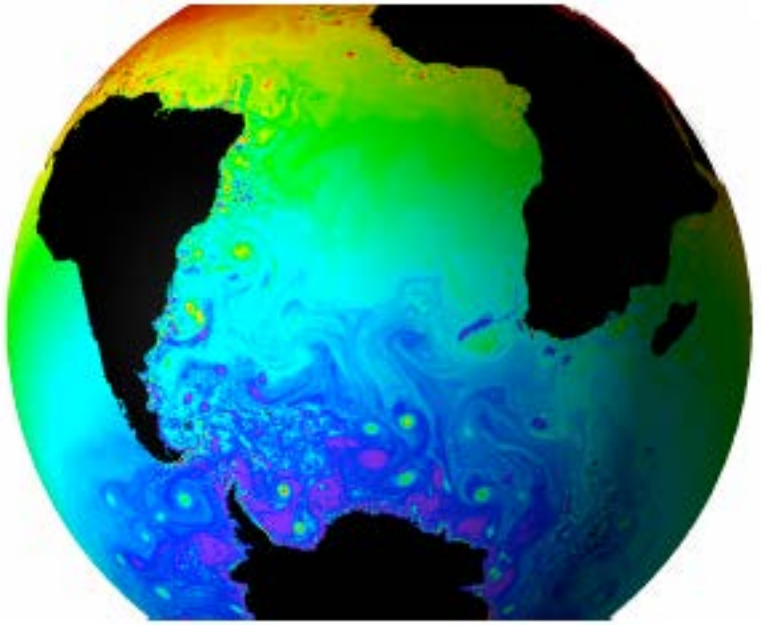
MPAS – examples





These are examples of different domain structures. The importance is that these structures can produce models that can efficiently use massively parallel computer architectures; new algorithms give an order of magnitude Increase in efficient core usage)

The computer science challenge, is how to deal with the order of magnitude increase in data i/o and how the networks will cope.



Summary

In this talk I have tried to provide

- **an illustration of an example of a weather scale simulation**
- **a way in which the weather / climate community have now, albeit slowly, adapted their algorithms and code for efficient use with massively parallel computers**
- **the example of the JASMIN system which is being used to cope with the increase networking and data storage demands**
- **a quick glimpse of two models which will be major players in the world of weather and climate modelling, next deacde**
- **why increased (order of magnitude plus) networking and data access will be required by the scientists in the next decade**

Questions please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NETWORKSHOP 42

AT LEEDS UNIVERSITY

1–3 APRIL 2014

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Janet Update 2014

Tim Kidd,
Operations Director

Jeremy Sharp,
Head of Strategic Technologies

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Agenda

- Infrastructure
- Service Update
- 30 years of Janet
- Video Collaboration
- Access and Identity Management
- E-infrastructure Support

janet

Agenda

- **Infrastructure**
- Service Update
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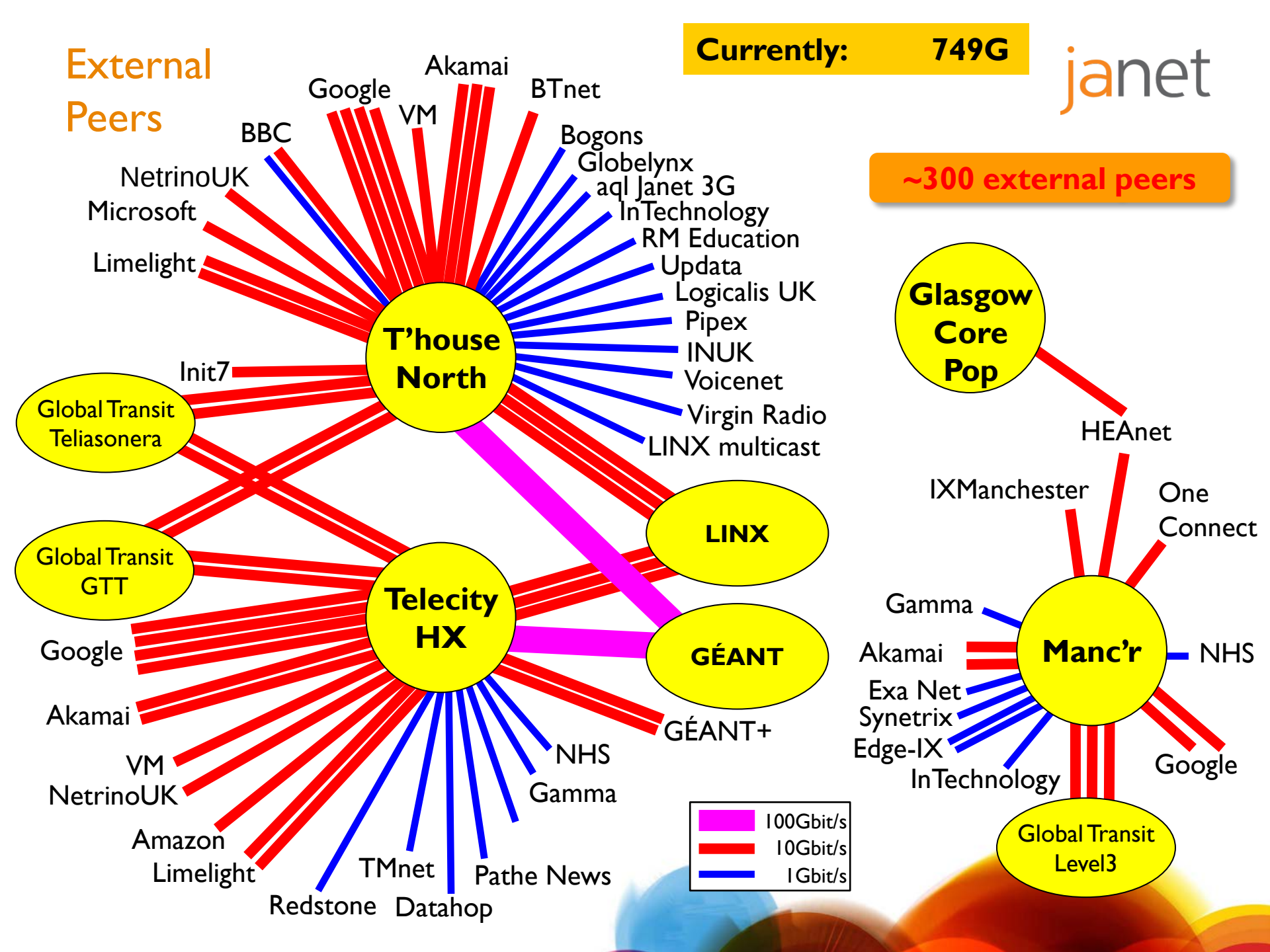
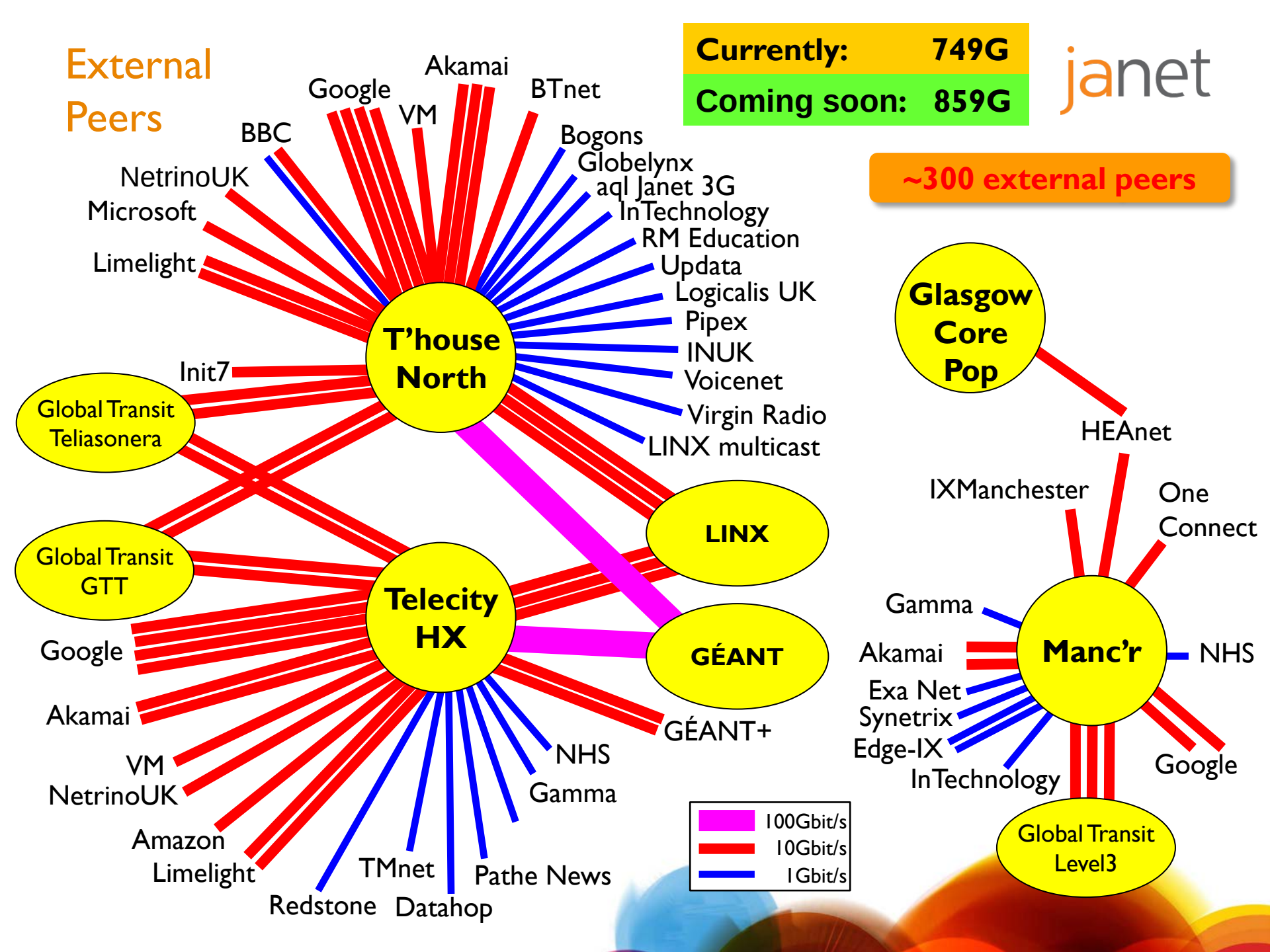
External Peers

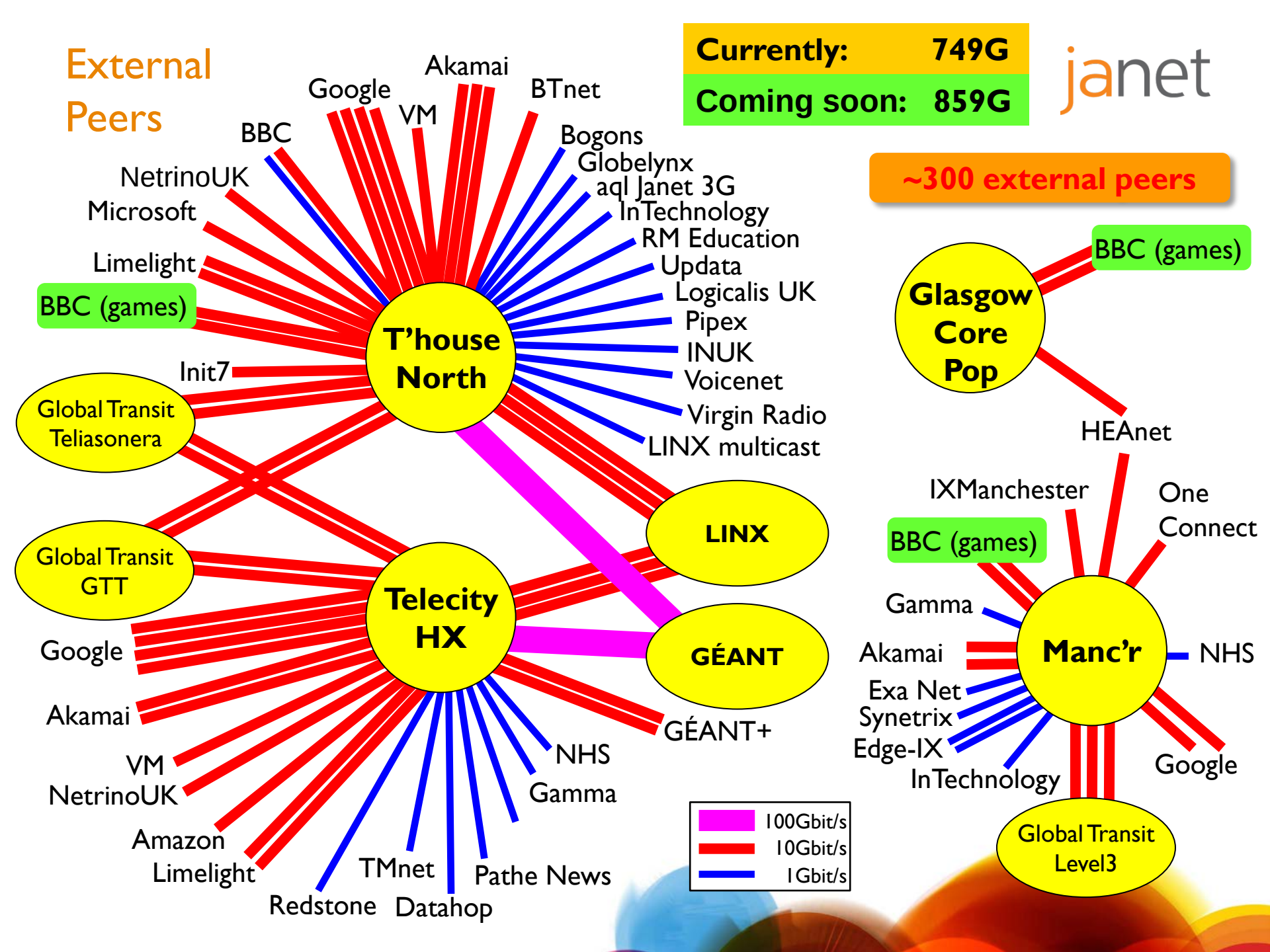
Currently: 749G

janet

~300 external peers




External Peers
Currently: 749G
Coming soon: 859G
janet
~300 external peers
Akamai
Google
BTnet
VM
BBC
Bogons
Globelynx
NetrinoUK
aql Janet 3G
Microsoft
InTechnology
RM Education
Limelight
Updata
Logicalis UK
Pipex
T'house North
INUK
Init7
Voicenet
Global Transit Teliasonera
Virgin Radio
LINX multicast
LINX
Global Transit GTT
Telecity HX
GÉANT
Google
GÉANT+
Akamai
NHS
VM
Gamma
NetrinoUK
Amazon
Limelight
TMnet
Pathe News
Redstone
Datahop
100Gbit/s
10Gbit/s
1Gbit/s
Glasgow Core Pop
HEAnet
IXManchester
One Connect
Gamma
Akamai
Manc'r
NHS
Exa Net
Synetrix
Edge-IX
InTechnology
Google
Global Transit Level3


External Peers
Currently: 749G
Coming soon: 859G
janet
~300 external peers
Akamai
Google
BTnet
VM
BBC
Bogons
Globelynx
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InTechnology
RM Education
Updata
Logicalis UK
Pipex
INUK
Voicenet
Virgin Radio
LINX multicast
NetrinoUK
Microsoft
Limelight
BBC (games)
Init7
Global Transit Teliasonera
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GÉANT+
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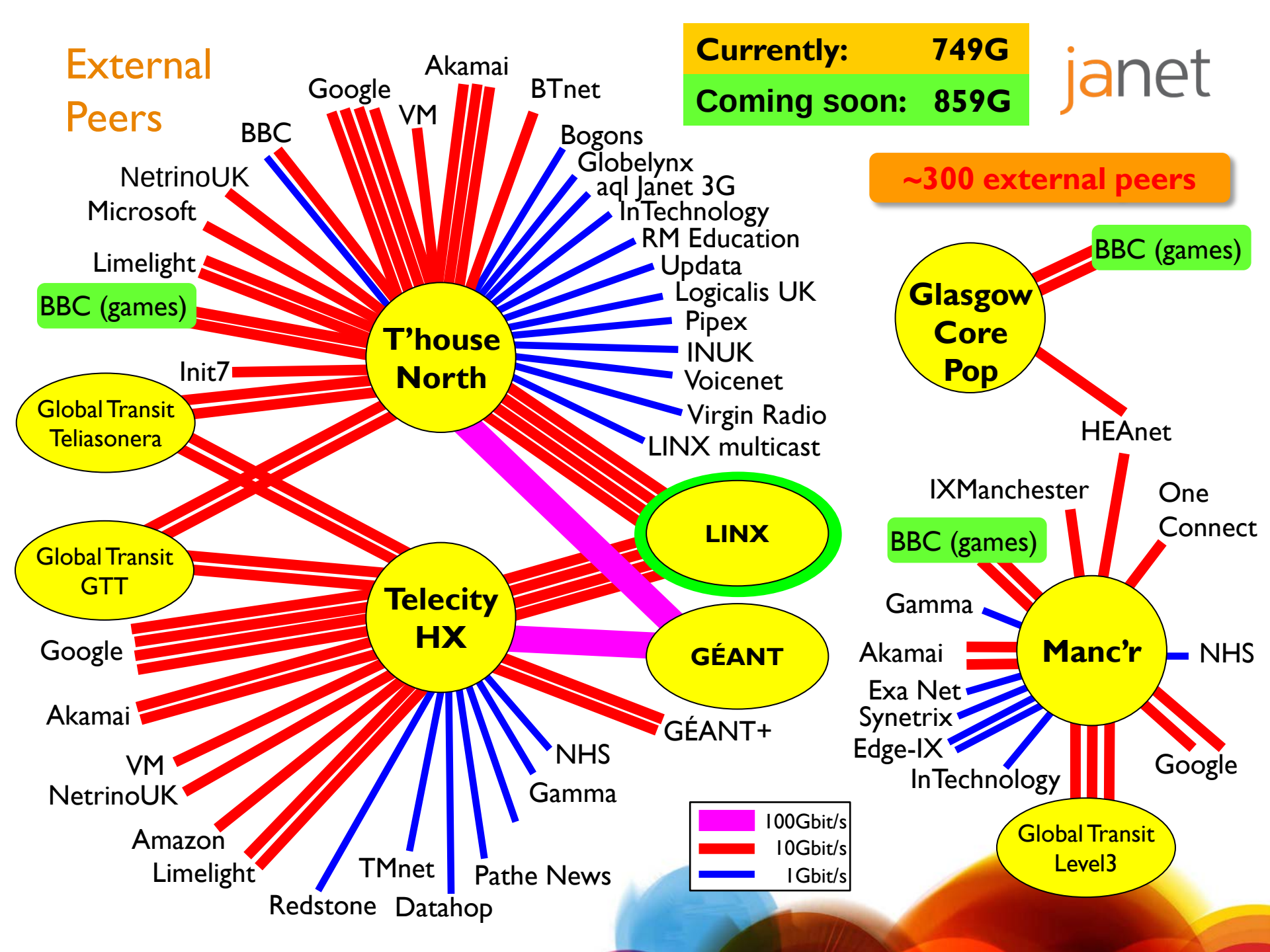
Synetrix
Edge-IX
InTechnology
Manc'r
NHS
Google
Global Transit Level3


External Peers
Currently: 749G
Coming soon: 859G
janet
~300 external peers
Akamai
Google
VM
BTnet
BBC
Bogons
Globelynx
aql Janet 3G
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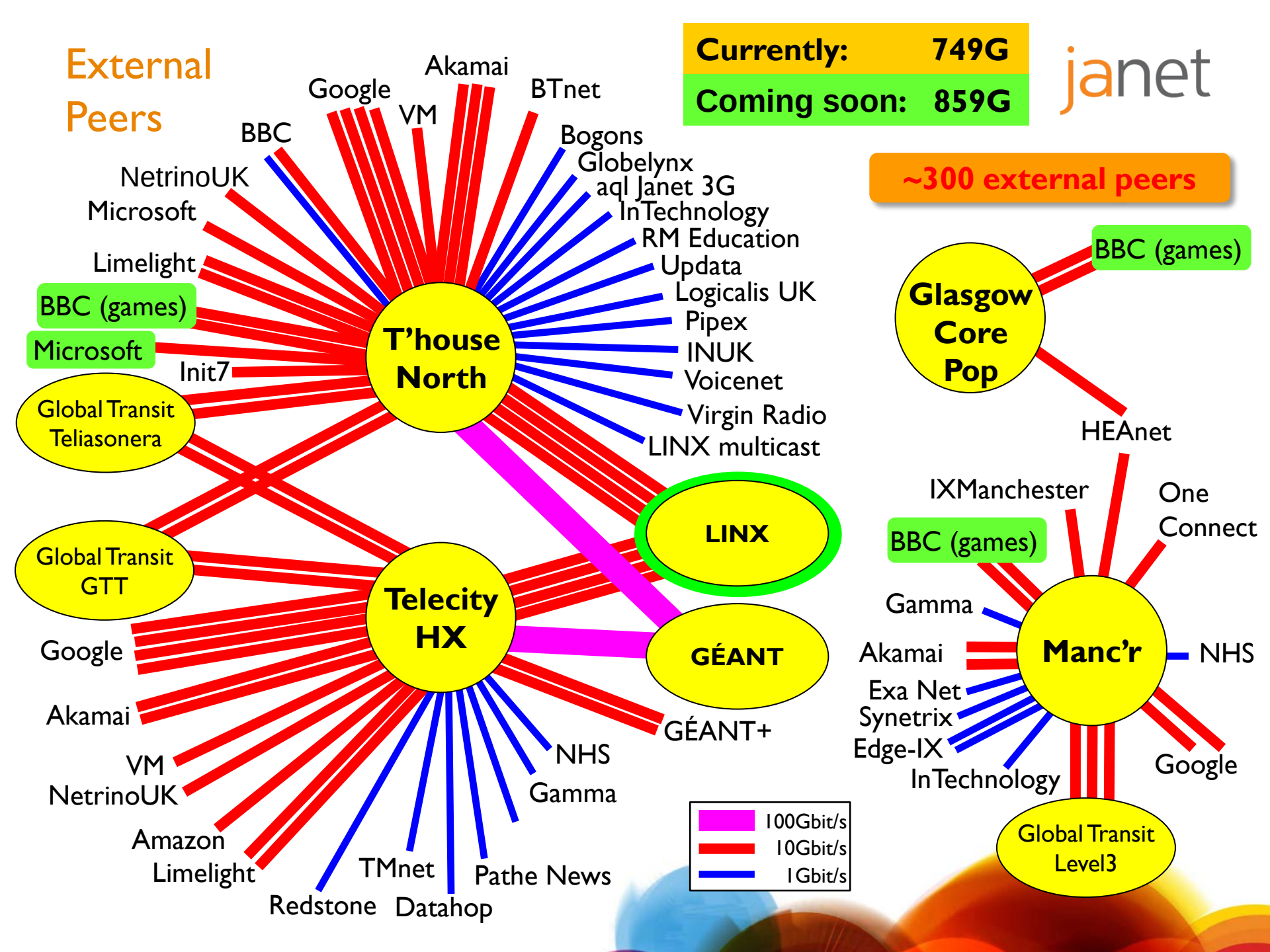
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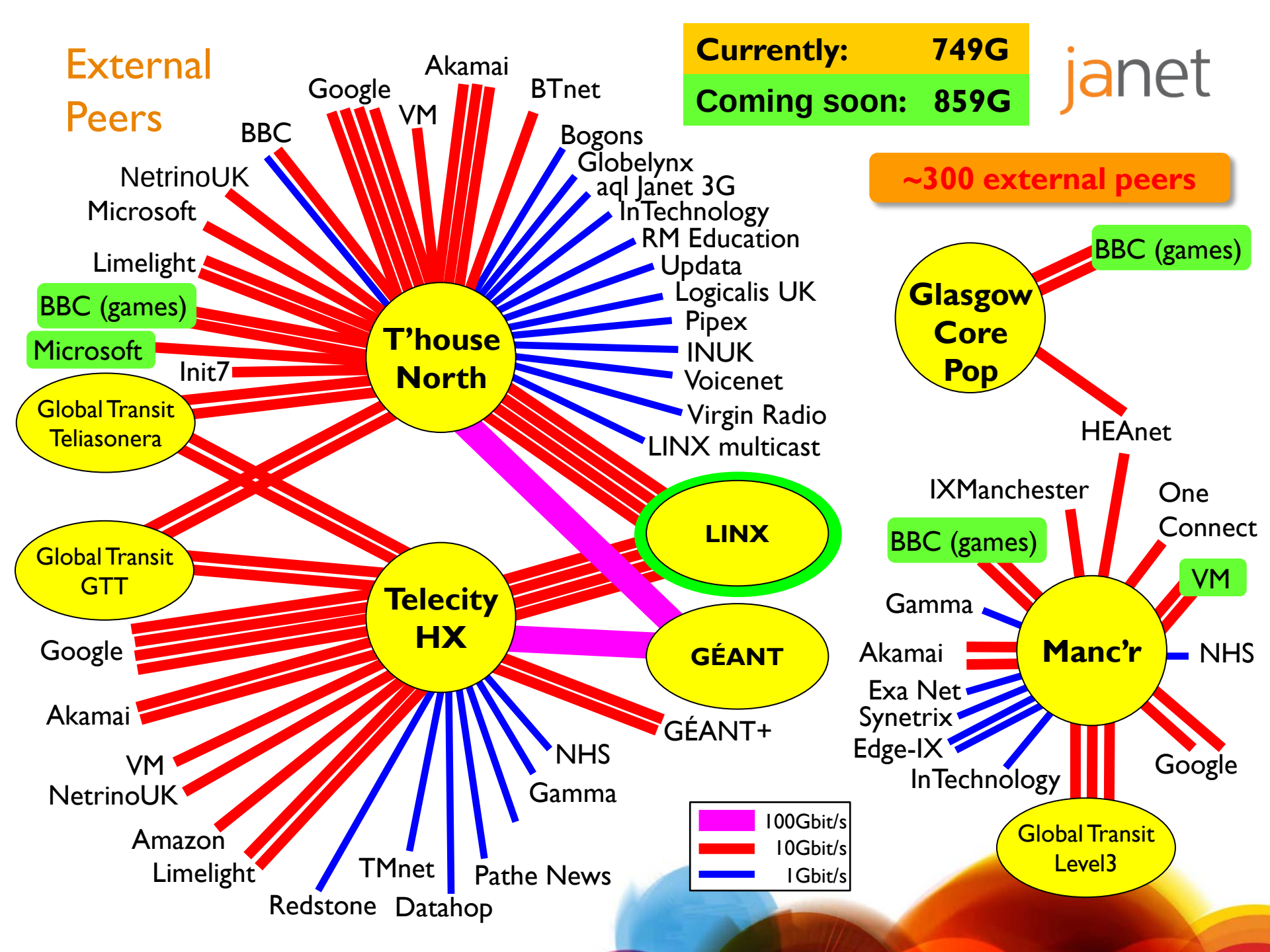
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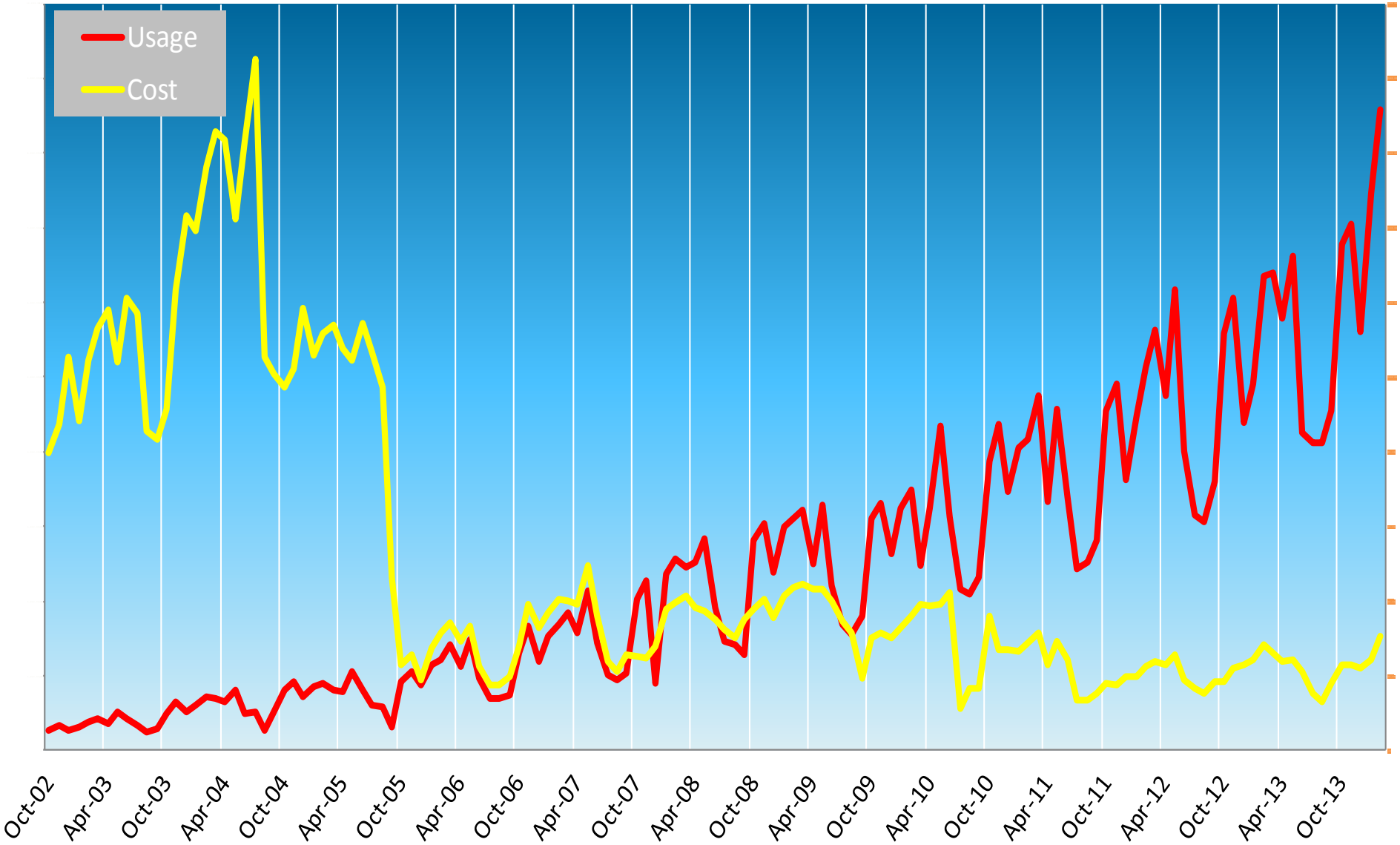
Google
Global Transit Level3

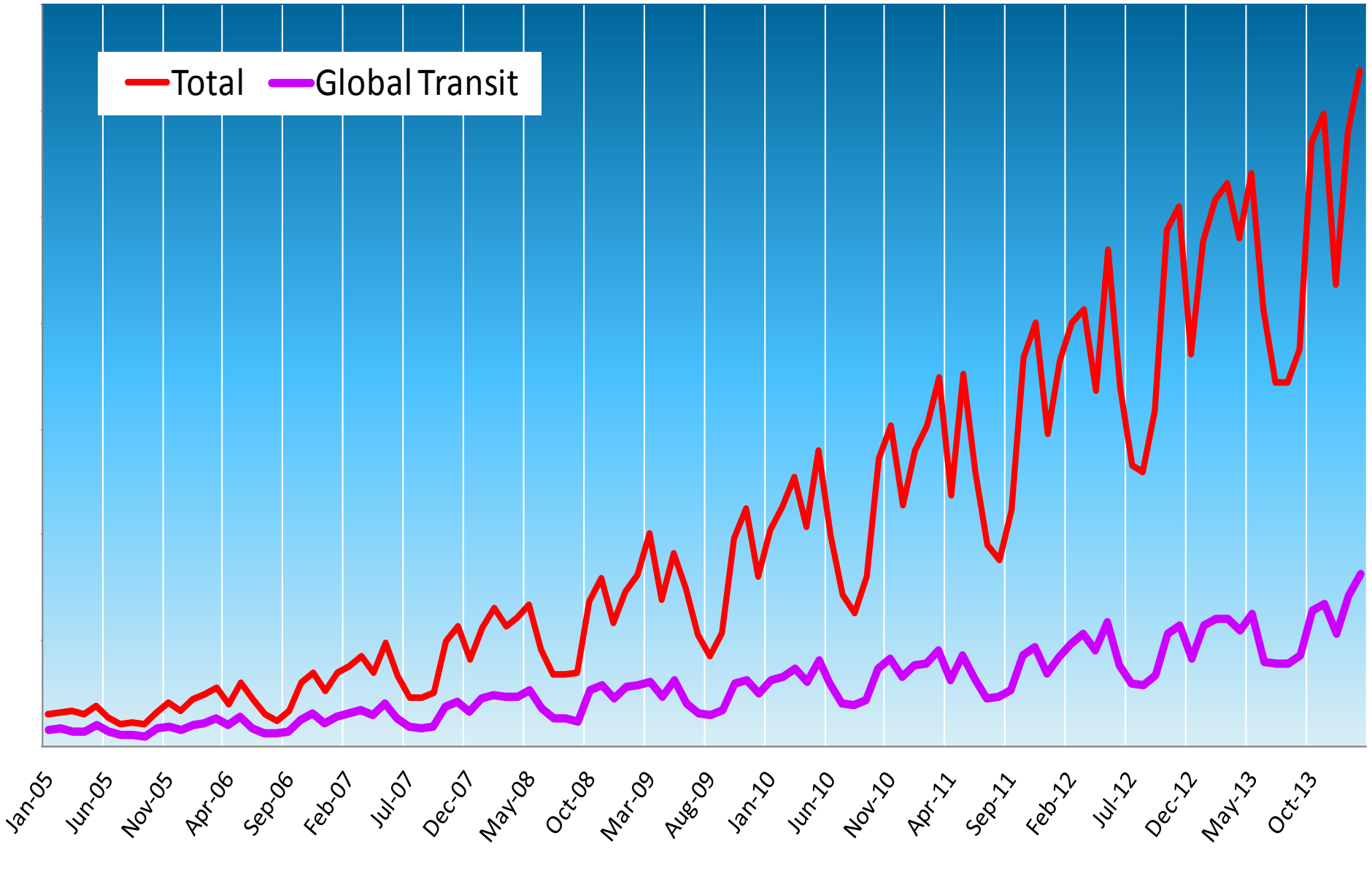
Global transit usage/cost

janet



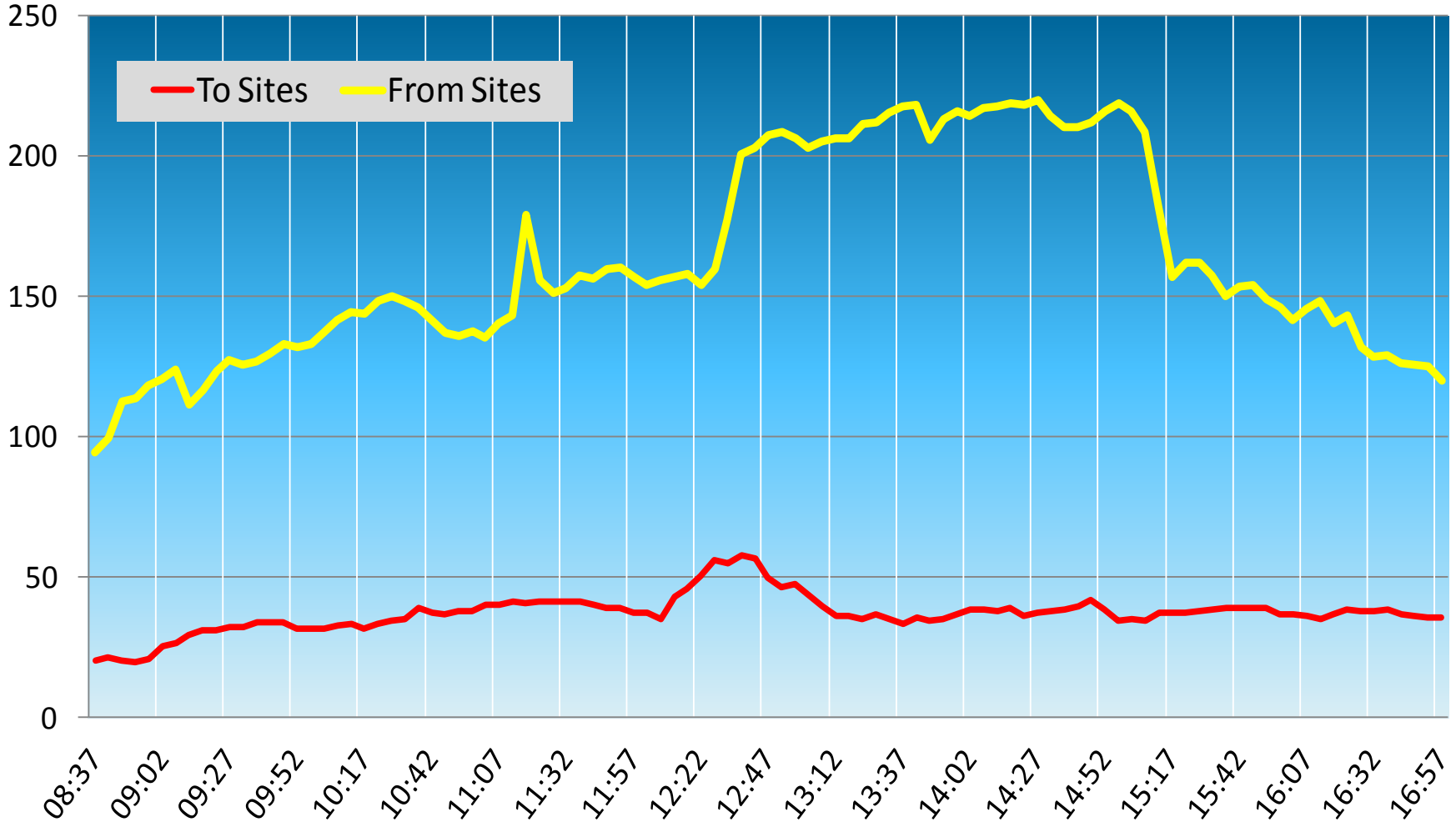
External traffic

janet



External traffic 200Gbit/s sustained peak!

janet



10 March 2014

Apple IOS 7.1 released.

janet

It shouldn't happen at Christmas...

Christmas 2013... (remember the weather?)

janet

Christmas Troubles...

Christmas Troubles...

Christmas Troubles...

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24th: 00:20 Loss of connectivity.

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Poulton Park?

janet

Peppa Pig World

Poulton Park?

janet

Peppa Pig World

Poulton Park?

janet

Peppa Pig World

It's just a Pylon...

janet

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janet

It's just a Pylon...

janet

- Overhead Power Ground Wire (OPGW).
  - Bonds pylons to earth.
  - Protects against lightning.

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janet

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- Optical OPGW (OOPGW)
  - Also carries fibre.

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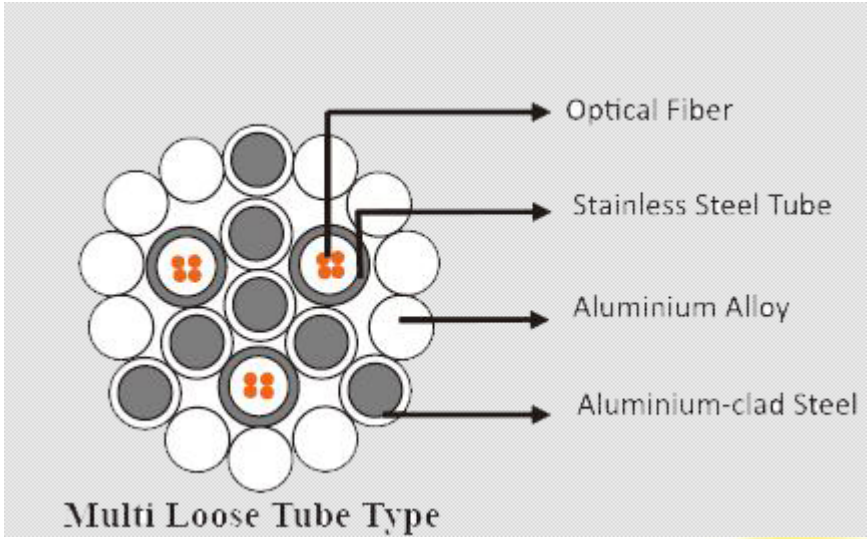

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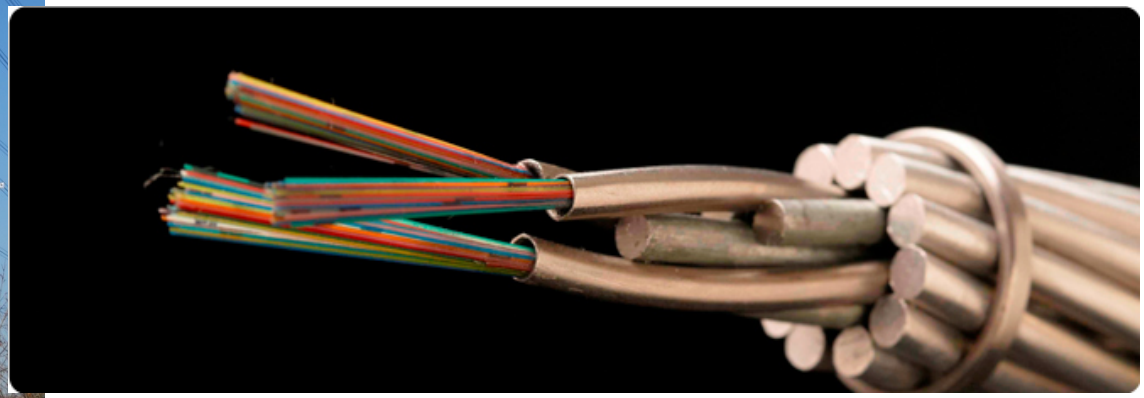

How do I know so much about pylons?

janet

I made the mistake of asking John Seymour (Head of Network Operations)

How do I know so much about pylons?

janet

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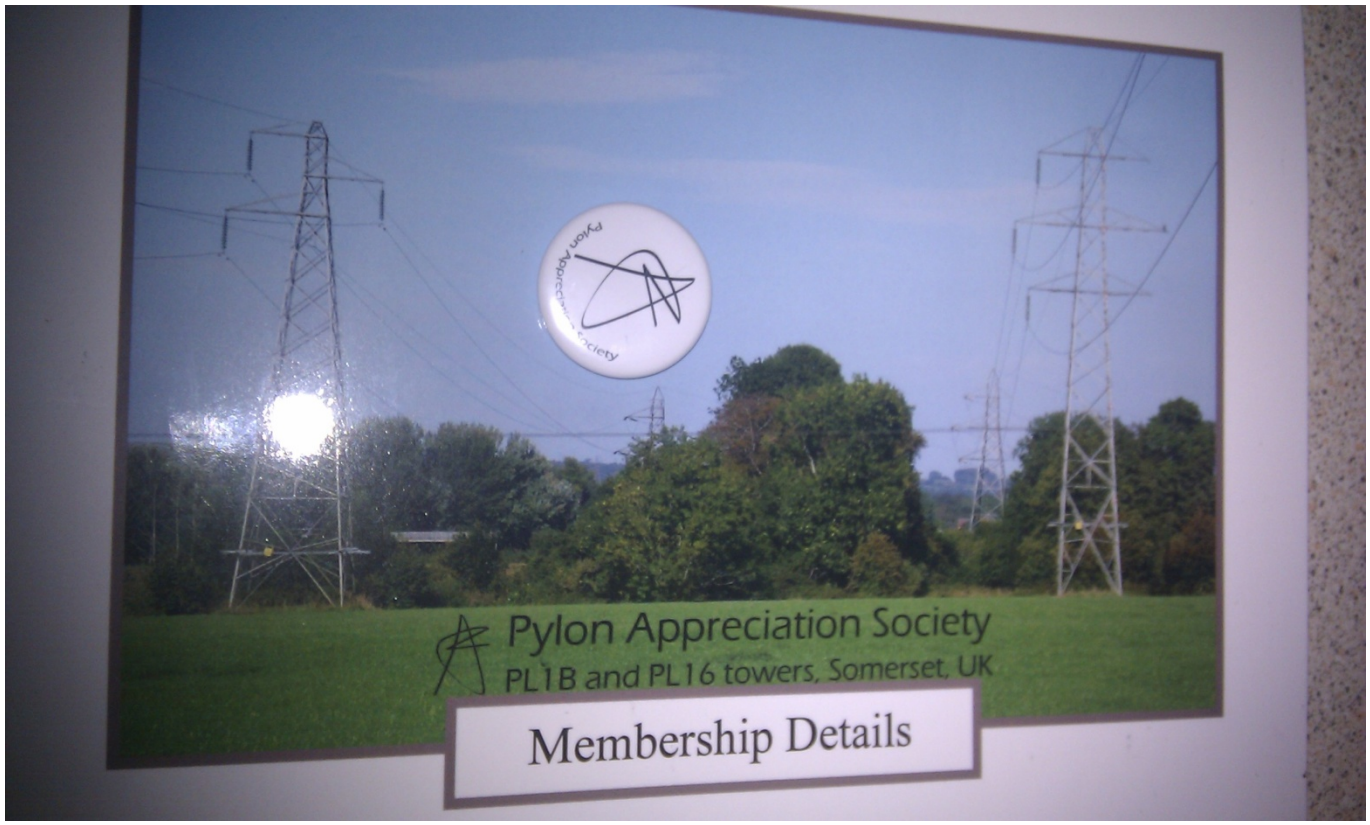

The Pylon Appreciation Society.... (really!)

How do I know so much about pylons?

janet

How do I know so much about pylons?

janet

How do I know so much about pylons?

janet

Pylon of the Month

All about electricity pylons and electricity supply

January 04, 2014

➜ Pylon of the Month - January 2014

Regular readers of this blog are probably looking at this month's pylon and wondering what is going on, but for the first pylon of 2014 I thought that it would be appropriate to feature the first artist to recognise the significance of the

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Pylon Books

Brian Hayes: Infrastructure: A Field Guide to the Industrial Landscape

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The problem...

janet

The problem in detail...

Christmas Troubles...

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13:30 Start tree removal.

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	13:30	Start tree removal.
	17:30	H&S wait until 26th.

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	12:30	...ground too soggy!
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		Eqpt needed to drop fibre ...all in use elsewhere.
	15:40	Tree removed!

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	12:05	Break at Poulton Park.
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	17:30	H&S wait until 26th.
25th:		It's Christmas!
26th:	12:00	Mobile platform for tree removal on site.
	12:30	...ground too soggy!
		Eqpt needed to drop fibre ...all in use elsewhere.
	15:40	Tree removed!
	15:45	Two more fibre breaks found.

Christmas Troubles...

Christmas Troubles...

27th: 09:30 *Special* mobile platform arrived.

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10:30 ...and it has a mechanical fault.

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12:23 Third platform now on site.

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14:55 Taller platform on site.

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	14:55	Taller platform on site.
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		...third break needs a temporary road for the equipment.
	13:03	Temporary road installed.

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16:22 First joint complete.

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...third break needs a temporary road for the equipment.

13:03 Temporary road installed.
...too much wind

18:00 Wind dropped.

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	10:30	...and it has a mechanical fault.
	12:23	Third platform now on site.
	13:07	...it's not tall enough.
	14:55	Taller platform on site.
	16:22	First joint complete.
30th:	09:18	Second joint complete.
		...third break needs a temporary road for the equipment.
	13:03	Temporary road installed. ...too much wind
	18:00	Wind dropped.
	19:42	Final joint completed. **Service restored!**

janet

Agenda

- Infrastructure
- **Service Update**
- 30 years of Janet
- Video Collaboration
- Access and Identity Management
- E-infrastructure Support

Security Update

janet

Janet ESISS...

Automated Accredited Penetration Testing
Manual Penetration Testing
Consultancy Services

For more information and charges contact service@ja.net

Security Update

janet

Janet ESISS...

Automated Accredited Penetration Testing
Manual Penetration Testing
Consultancy Services

For more information and charges contact service@ja.net

BOF: Wednesday 16:15
Lee Harrigan
Janet CSIRT

Service Update

janet

Microsoft Office 365 (May 13)
Google Apps for Education (Oct 13)
Arkivum Tape Storage (Jan 14)

Service Update

janet

Microsoft Office 365 (May 13)
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Trans National Education pilot
launched in January 2014
with Educity in Malaysia

Service Update

janet

Microsoft Office 365 (May 13)
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Parallel: Tuesday 16:15
Josh Howlett, Janet
Jason Bain, Newcastle

janet

Agenda

- Infrastructure
- Service Update
- **30 years of Janet**
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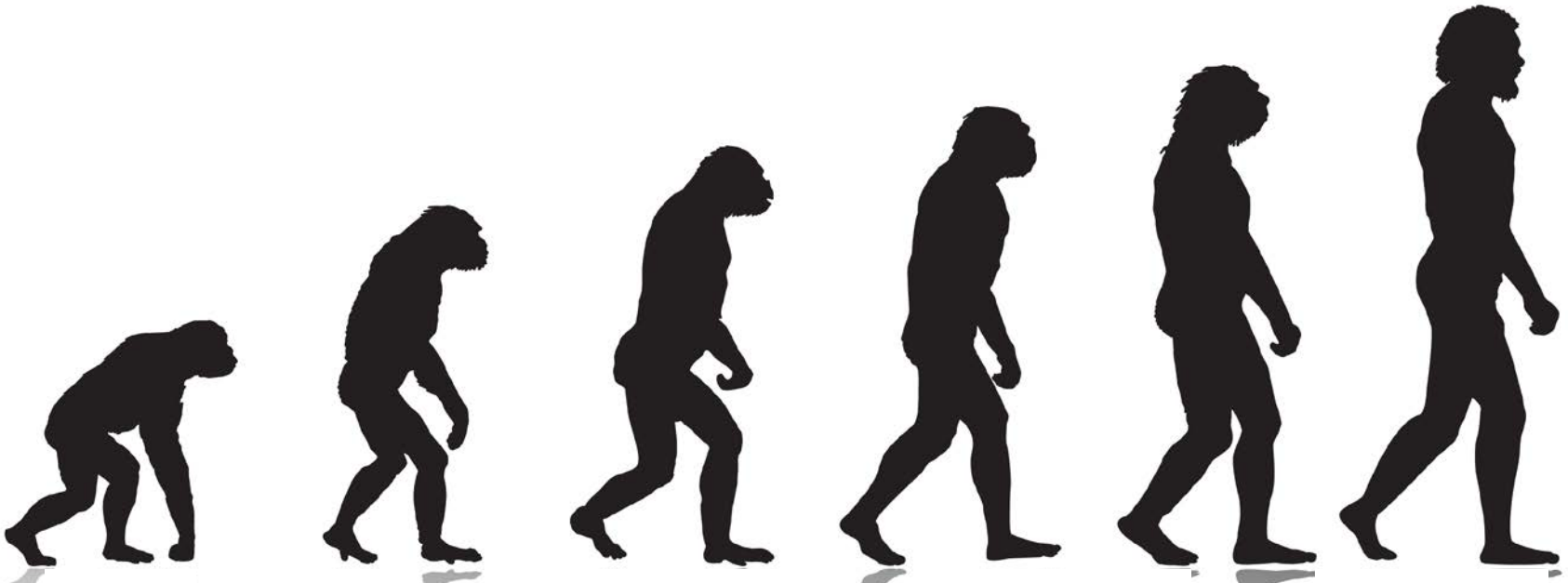
The Dawn of Janet

janet



Late 1970s

SRCnet

regional research networks

1984

JANET born
X.25 network
9.6kbit/s
50 sites

Late 1980s

X.25 network
2Mbit/s backbone
64kbit/s access
200 sites

Early 1990s

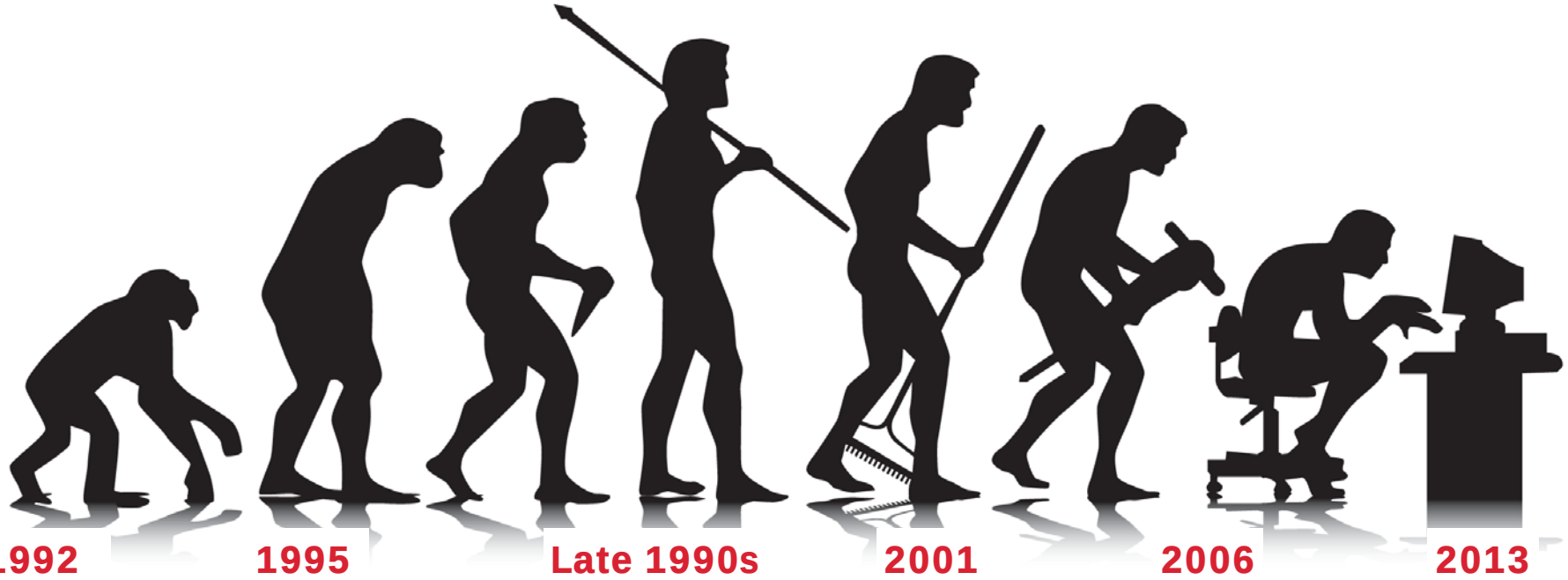
X.25 network
8Mbit/s backbone
2Mbit/s access

Early 1991

JANET IP Pilot
(over X.25)

Janet Comes of Age

janet



1992	1995	Late 1990s	2001	2006	2013
SuperJANET	SuperJANET II	SuperJANET III	SuperJANET4	SuperJANET5	Janet6
PDH & SMDS	IP over ATM	General bandwidth upgrade	10Gbit/s core	100Gbit/s core	Multiple 100Gbit/s
34Mbit/s backbone	155Mbit/s backbone		FE joins ≈1,000 sites		Optical

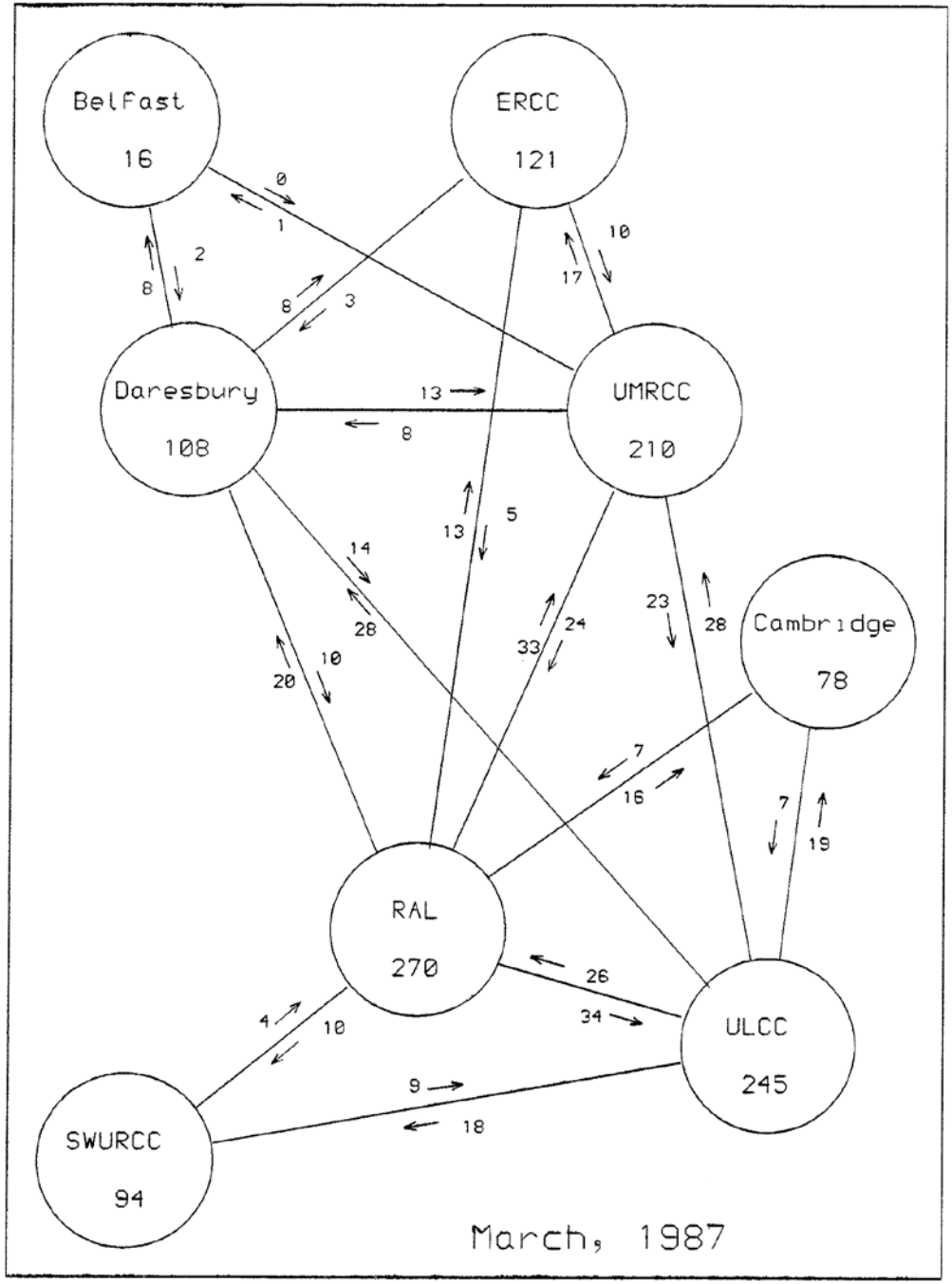
Reliability – 1986 style...

Switch Statistics - Jan.86

Switch	IPLs Total	IPLs Unsched	Lost Time (mins)	% Avail %	MTBF Unsched (hrs)
RAL	11	8	109	99.76	93
ULCC	3	2	84	99.81	372
UMRCC	9	8	62	99.86	93
BATH	3	1	137	99.69	720
BIDSTON	0	0	0	100.00	-
CAMBRIDGE	1	1	65	99.85	744
DARESBURY	12	12	53	99.88	62
EDINBURGH	6	5	208	99.53	148
SWINDON	3	2	512	98.85	372

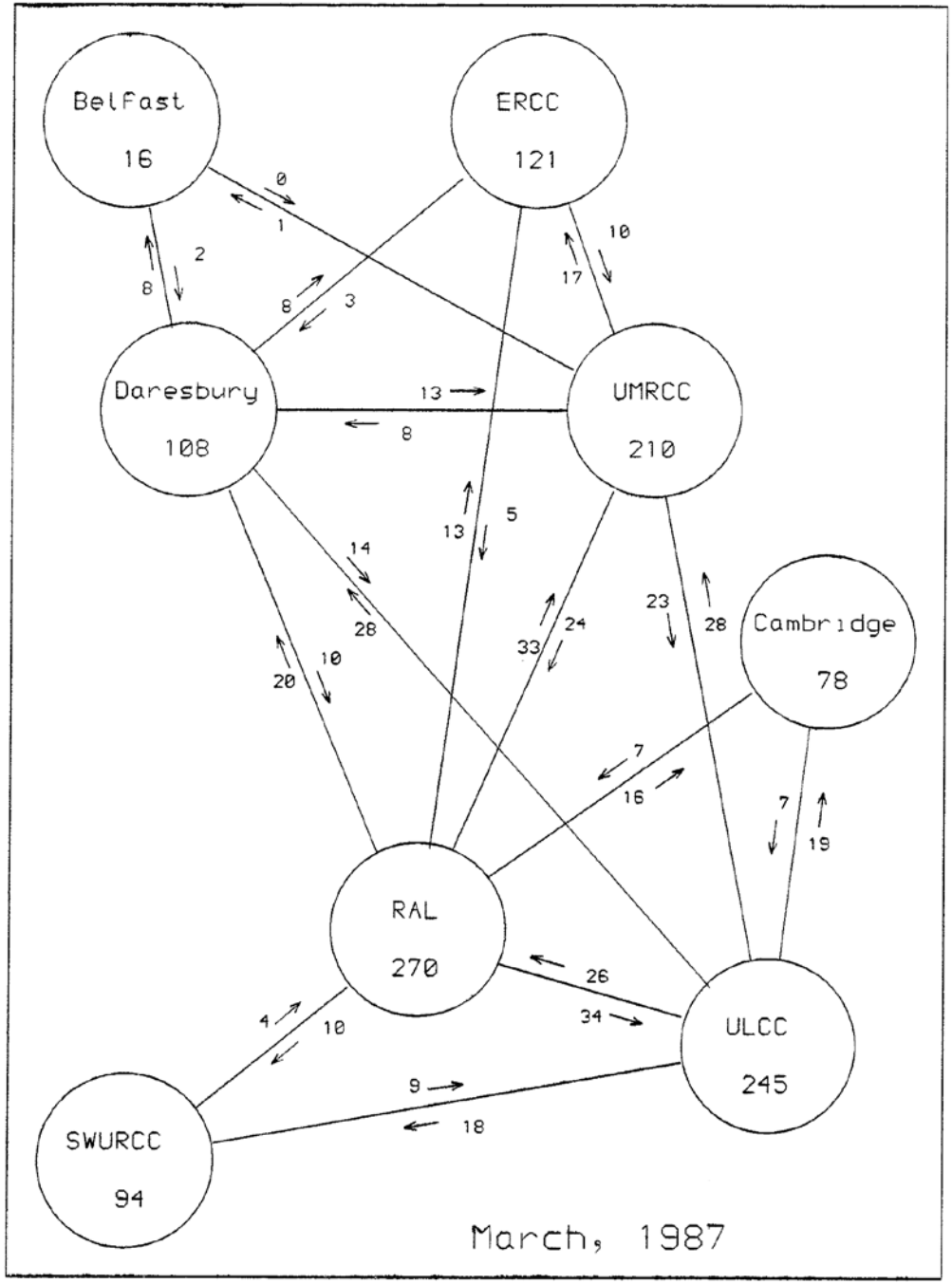
I.L.Smith 18/4/86

Numbers are traffic volume.



Numbers are traffic volume.

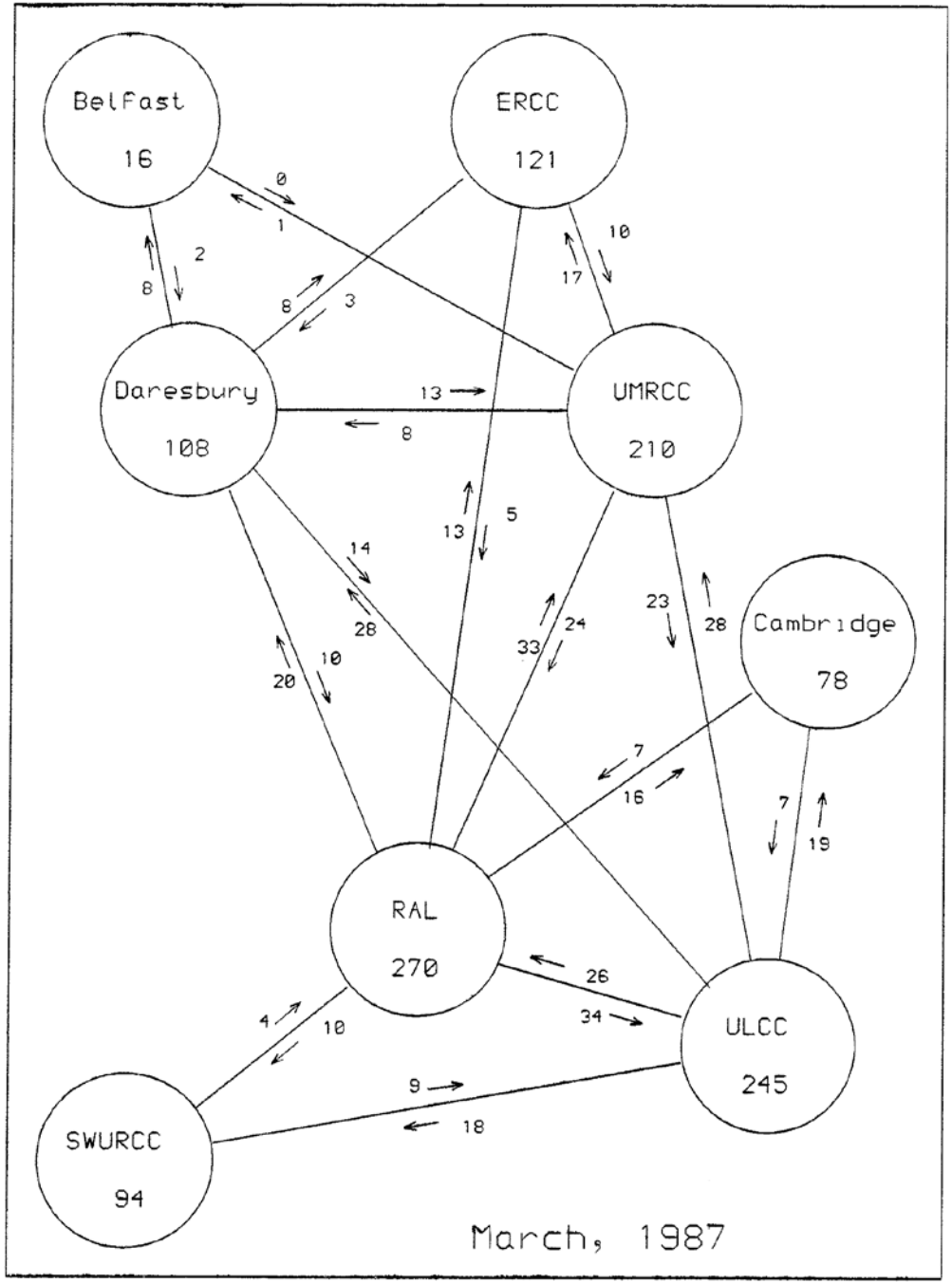
Guess the unit...



Numbers are traffic volume.

Guess the unit...

Mbytes/**day**.



Addressing Schemes...

janet

	ALLOCATED	CURRENT
'Old' Region		
Address Prefix	00000	
Reserved for compatibility with previous schemes.. not to be reallocated.		
Northern Region		
Address prefix	00001	
UMRCC	0000100xxxxx	~~0000100xxxxx~~
Manchester	0000101xxxxx	000001020xxx
UMIST	0000102xxxxx	~~2250~~
Keele	0000103xxxxx	000001102000
Lancaster	0000104xxxxx	~~000001101100~~
Liverpool	0000105xxxxx	000001030xxx
Salford	0000106xxxxx	~~000010600000~~
Daresbury	~~0000107xxxxx~~	00000100xxxx,00000101xxxx
Queens Belfast	0000112xxxxx	~~0000112xxxxx~~
UU Coleraine	0000113xxxxx	~~0000113xxxxx~~
UU Jordanstown	0000114xxxxx	~~0000114xxxxx~~
Leeds	0000120xxxxx	000001080500 - 000001080999
Bradford	0000121xxxxx	000001080000 - 000001080499
Sheffield	0000122xxxxx	000001070xxx
Hull	0000123xxxxx	
York		000006xxxxxx
Aberystwyth	0000130xxxxx	~~000013000000~~
Bangor	0000131xxxxx	000001050xxx
ITE Bangor	~~0000132xxxxx~~	00000300 8xxx
133xxxxx → NERC Bidston	~~0000133xxxxx~~	000003xxxxxx
Newcastle		00000150 0xxx
Durham	0000140xxxxx	~~00000150 1000~~ ~~00000150 2xxx~~ 2704
Lancashire Poly	0000145xxxxx	
Teesside Poly	0000146xxxxx	
Huddersfield	0000147xxxxx	
Central Region		
Address prefix	00002	
Birmingham	0000200xxxxx	000001060xxx,2302,2605
Aston	0000201xxxxx	
Nottingham	0000210xxxxx	~~000021000000,14~~ 2502
Loughborough	0000211xxxxx	
Leicester	0000212xxxxx	
IGS Keyworth	~~0000213xxxxx~~	000003007xxx
~~Leicester Poly~~		~~2307~~
Cambridge		000008xxxxxx
E Anglia		000008006xxx
LMB		00000 80080xxx

ITE Bangor 1410xxxx
Abery 1411xxxx
Winds 1412xxxx
Merle 1413xxxx

NRS 00001490 1000
Edinburgh 15xxxxxx
16xxxxxx

Trent Poly 144 xxxxx
Liverpool Poly. 143xxxxx

Addressing Schemes...

janet

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E Anglia		000008006xxx
LMB		00000 80080xxx

ITE Bangor 1410xxxx
Abery. 1411xxxx
Winds 1412xxxx
Merle 1413xxxx

NRS 000014901000
Edinburgh 15xxxxxx
16xxxxxx

Trent Poly 144xxxxx
Liverpool Poly. 143xxxxx

tell Cambridge they can't have 220xxxxx any more. Instead. 219xxxxx if want it

Celebrating 30 Years of Janet

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Join us for birthday cake straight after this plenary session.

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Look back to the past on the web! Dedicated area to celebrate 30 years of Janet.

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The future: join community.ja.net

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#nws42
@UKNetworkshop

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Agenda

- Infrastructure
- Service Update
- 30 years of Janet
- **Video Collaboration**
- Access and Identity Management
- E-infrastructure Support

Reinventing Janet videoconferencing – v-scene

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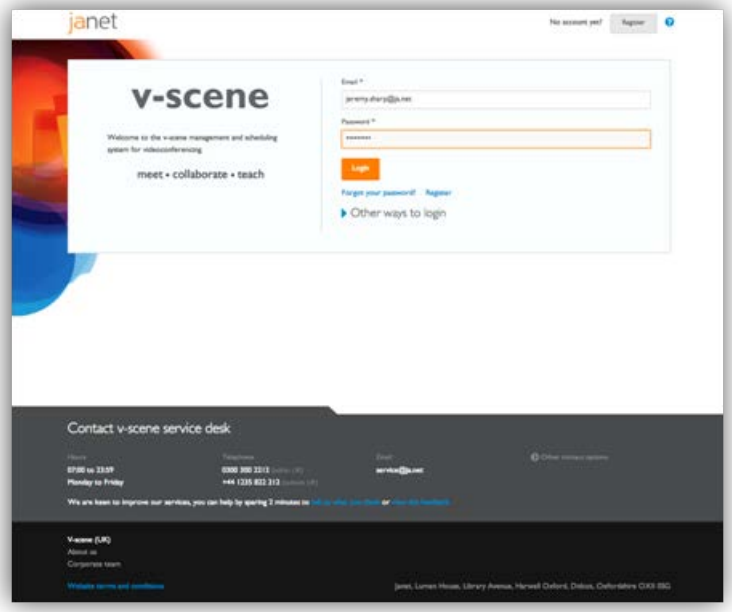
- Organise and schedule
- Interoperability
- Intuitive interface
- Automated testing

- Launching in July 2014



Supporting networked video

janet

Supporting networked video

- Low latency video

Supporting networked video

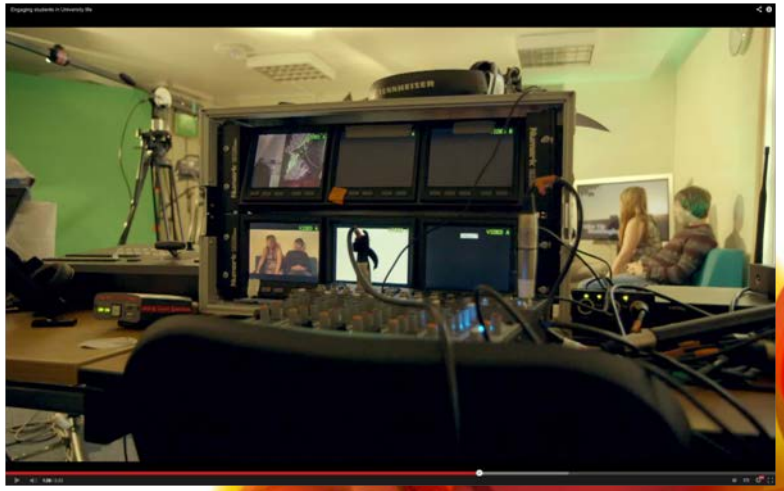
janet

- Low latency video
- High definition video

Supporting networked video

janet

- Low latency video
- High definition video
- Streamed video



Supporting networked video

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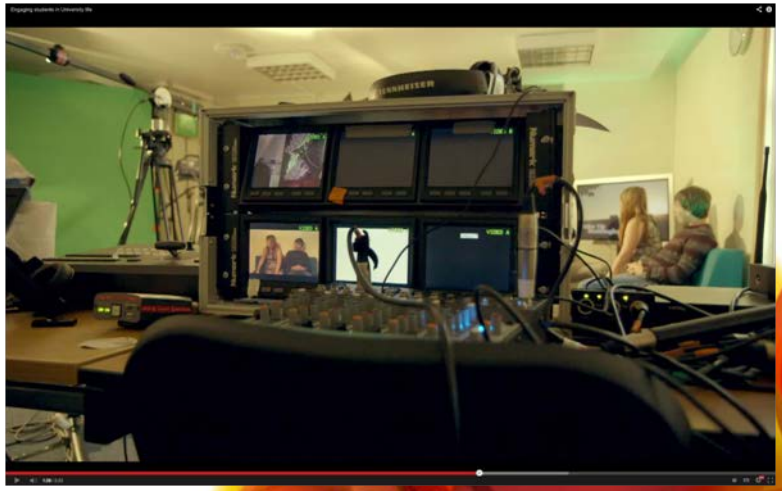
- Low latency video
- High definition video
- Streamed video
- Contribution video



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Strategy

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The UK Access Management Federation
FOR EDUCATION AND RESEARCH

eduroam

Plan

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- Reprocured CA
- Richer variety of certificates

- Managed service

- Service launch 1H2015
- Azure Moonshot

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Agenda

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Connectivity to key national research facilities

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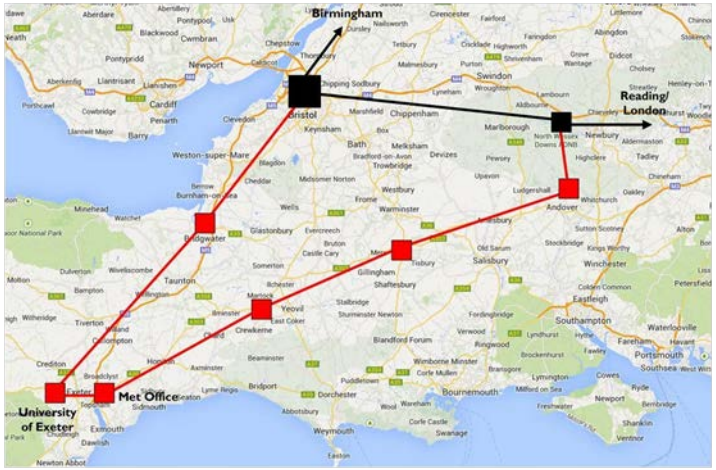

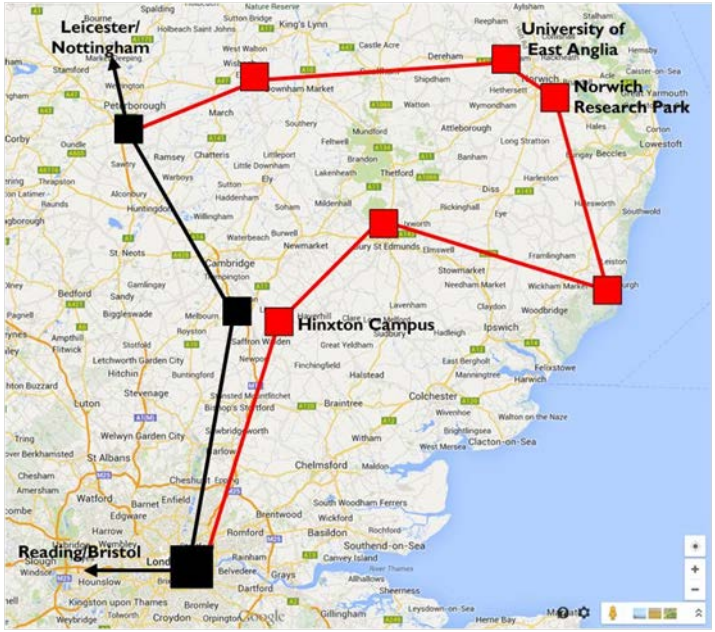

Connectivity to Janet6

- Hinxton Campus
- Met office
- Norwich research park
- Francis Crick institute

Janet Reach

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- Industry connectivity to Janet
- To support collaboration in use of e-infrastructure resources
  - Access to knowledge & experience
  - Access to resources (e.g. HPC)
  - Janet connectivity when at scale
- Compliant with state aid

Shared Datacentre

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- Requirements driven by
  - Francis crick Institute
  - Kings College London
  - LSE
  - Sanger
  - UCL
- Framework to be established
- Janet the procurement authority and network provider
- 60% research systems, 40% enterprise system hosting
- Up and running in July

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Very busy last year...

Very busy year ahead...

We continue to do our best to serve the community.

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NETWORKSHOP 42

AT LEEDS UNIVERSITY

1–3 APRIL 2014