

Introduction to NW-GRID

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Four compute clusters funded by NWDA are accessible using Grid middleware and connected using a dedicated fibre network:

- Daresbury –
 - dl1.nw-grid.ac.uk - 96 nodes (some locally funded)
- Lancaster –
 - lancs1.nw-grid.ac.uk - 192 nodes (96 dedicated to local users)
- Liverpool –
 - lv1.nw-grid.ac.uk - 44 nodes
- Manchester –
 - man2.nw-grid.ac.uk – 27 nodes

Pictures



Anatomy of a Cluster



- Compute clusters from Streamline Computing
- 2x Sun x4200 head nodes
 - dual-processor single-core AMD Opteron 2.6GHz (64-bit)
 - 16GB memory
- Panasas file store
 - around 3-10TB per cluster (Manchester client only)
- Sun x4100 nodes
 - Dual-processor dual-core AMD Opteron 2.4GHz (64-bit)
 - 2-4GB memory pre core
 - 2x 73GB disks per node
 - Gbit/s ethernet between nodes
- Sun Grid Engine and Streamline cluster management
- Software – will be discussed during the rest of this course

Connecting the Nodes



- within a “module” and between modules
- dual Gbit-E network
 - inter-node communications via stacked Nortel Gbit switch
 - command, control and file access via 2nd stacked Nortel Gbit switch
- Ethernet network
 - diagnostics via standard ethernet switch
- Link to Panasas if installed

DL Cluster Detail

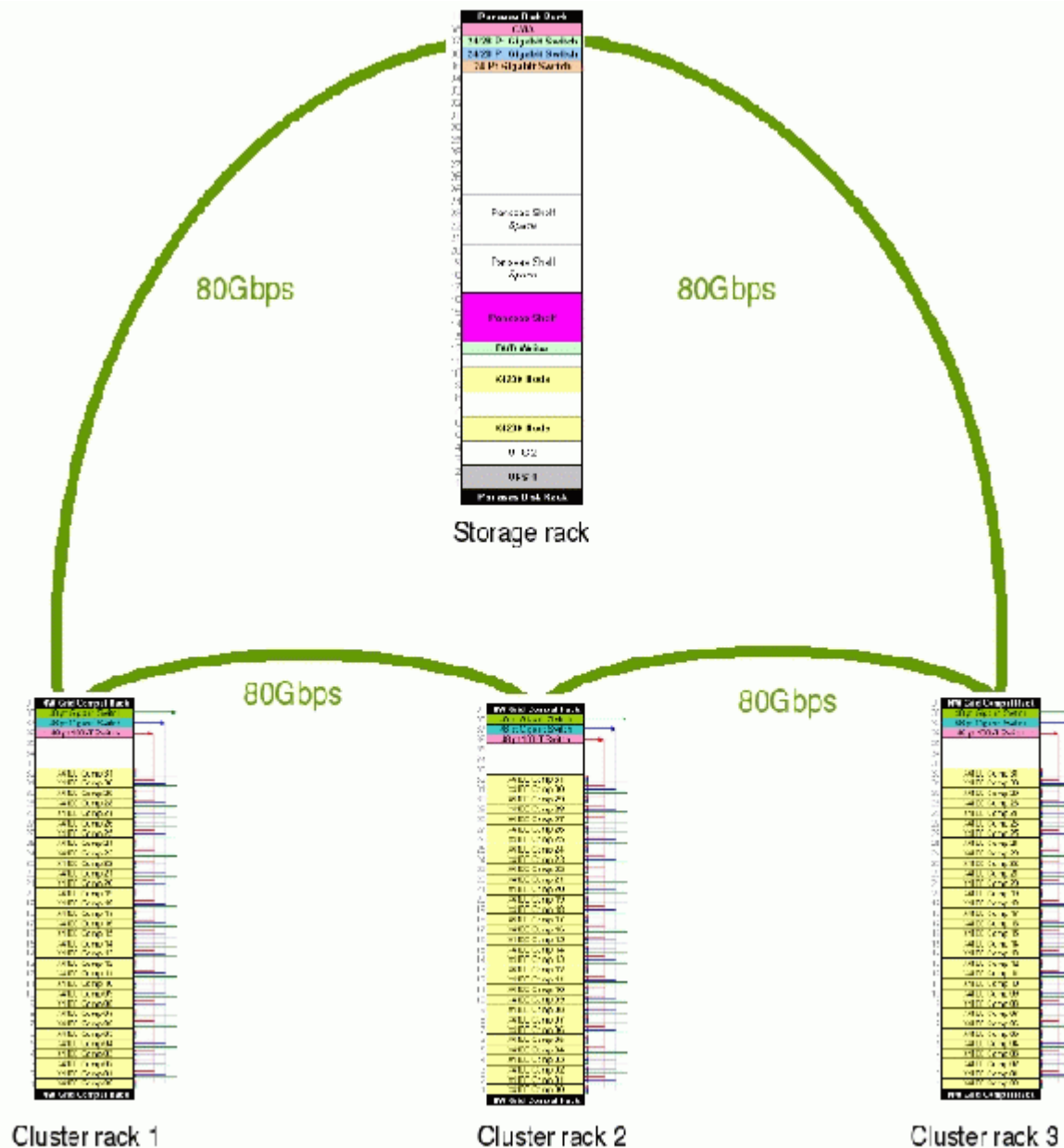


DL Cluster has 4 racks.

32 nodes per compute rack plus 3 switches.

Gbit-E (80Gb/s) links between compute racks and into head node shown in green.

2x head nodes, Panasas storage and external connection in central rack.



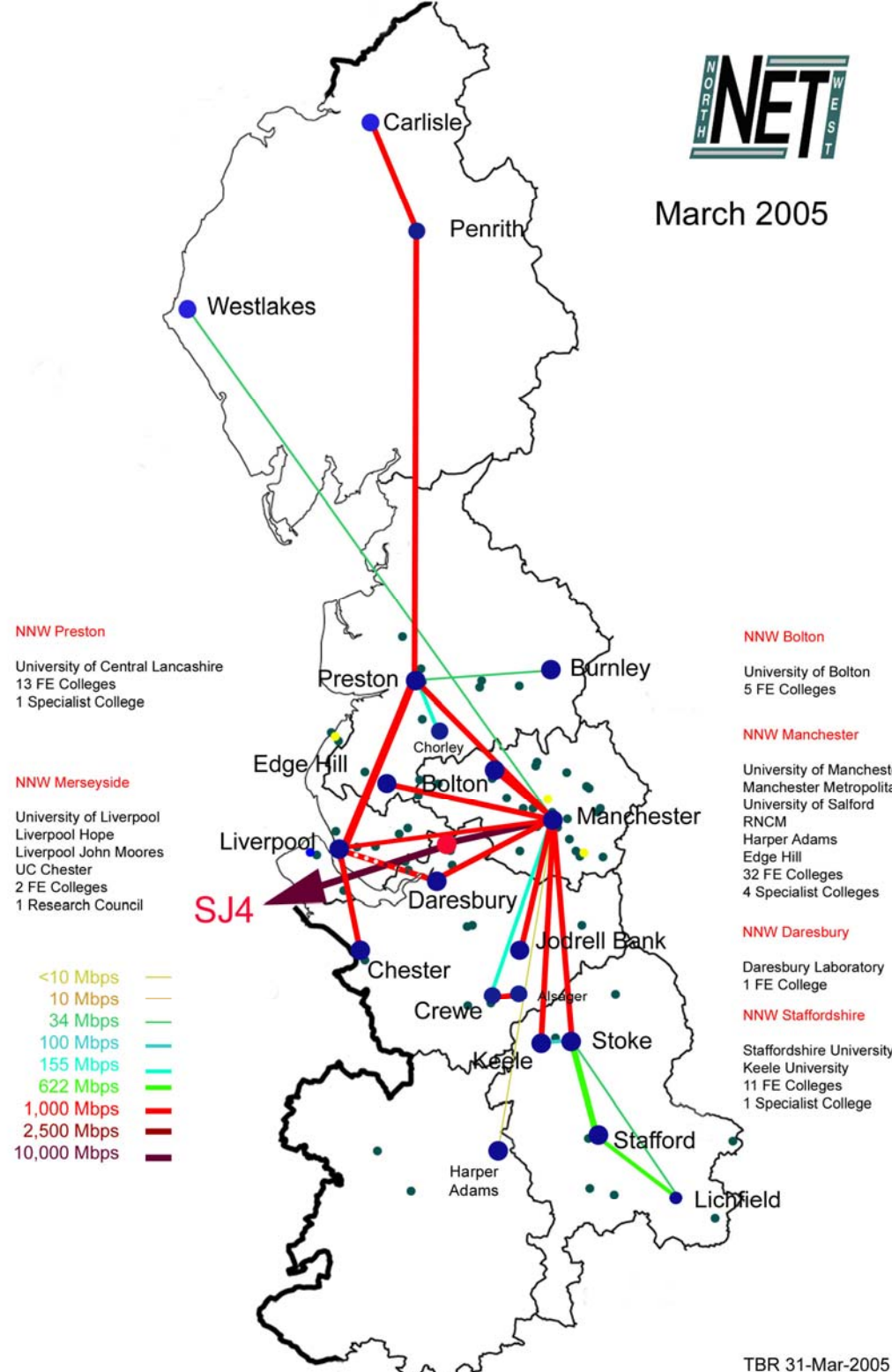
Connecting the Clusters



- Map of the NW – on next slide
- HP Procurve/ 3Com switch is part of each control module
- External connection
 - Private Fibre network
 - SuperJANET
- Commercial access is possible by VPN and will use the fibre network



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NNW Preston

- University of Central Lancashire
- 13 FE Colleges
- 1 Specialist College

NNW Merseyside

- University of Liverpool
- Liverpool Hope
- Liverpool John Moores
- UC Chester
- 2 FE Colleges
- 1 Research Council

NNW Bolton

- University of Bolton
- 5 FE Colleges

NNW Manchester

- University of Manchester
- Manchester Metropolitan
- University of Salford
- RNCM
- Harper Adams
- Edge Hill
- 32 FE Colleges
- 4 Specialist Colleges

NNW Daresbury

- Daresbury Laboratory
- 1 FE College

NNW Staffordshire

- Staffordshire University
- Keele University
- 11 FE Colleges
- 1 Specialist College

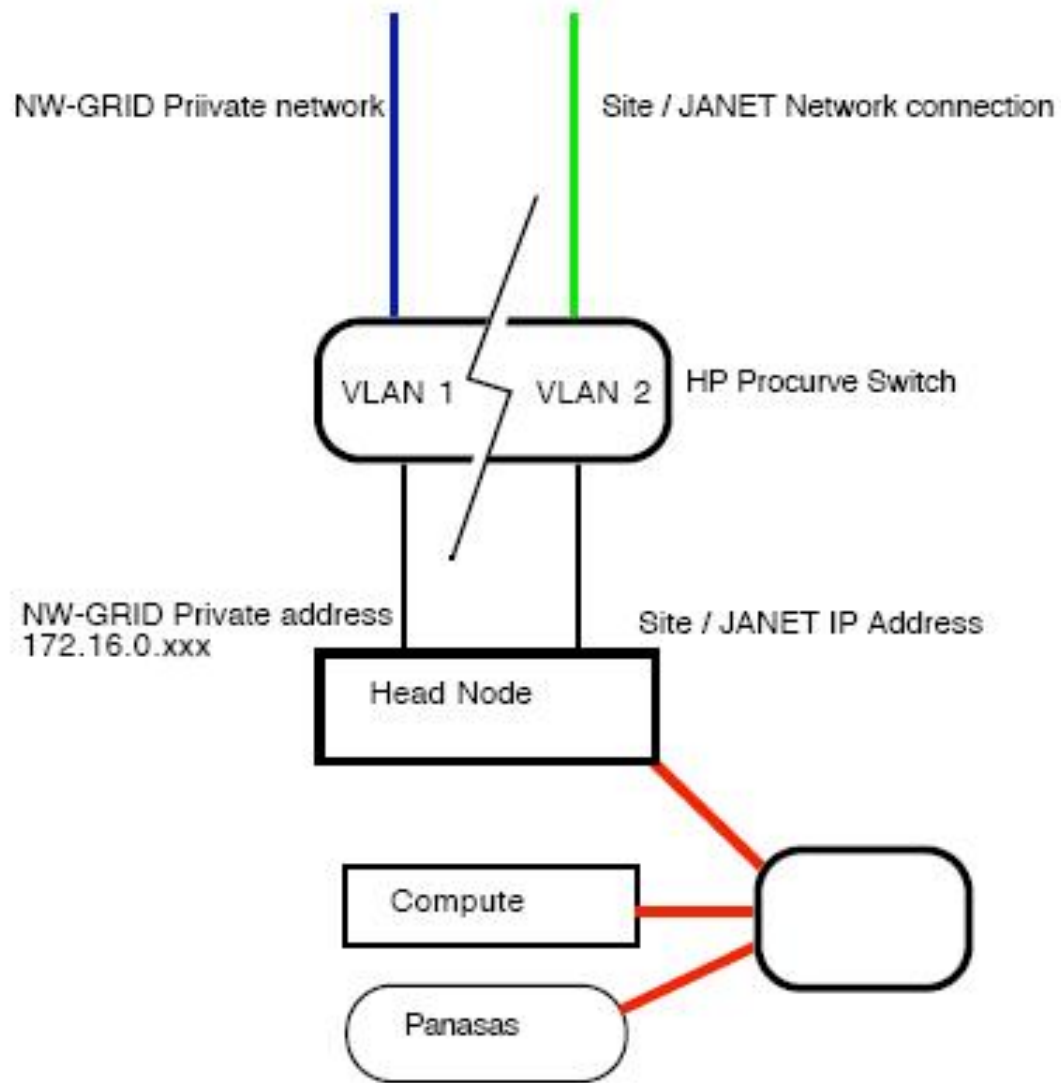
NW-GRID Fibre Network



- 1Gb/s between sites – latency?
 - DL-Lancs trunk - 10x 1Gb/s links
 - DL-Manchester – single link
 - DL-Liverpool – single link
- What can it enable us to do?
 - Scheduling, job migration, visualisation etc.
 - do you have other ideas?



External Connections



Other Resources



- Manchester – see <http://man4.nw-grid.ac.uk>
 - man1.nw-grid.ac.uk - Weyl cluster, It is a 44 node system plus login and master nodes. The address of the login node is weyl.mc.man.ac.uk and IP address is 130.88.200.240. Compute nodes 01 - 40 are dual processor AMD Opteron 248 2GHz, 78GB of disk, 2GB memory. Nodes 41 - 43 are fat nodes with the same spec as above except the memory is 8GB. The user, scratch and software disks are RAID, 2.5TB, NFS mounted.
 - man3.nw-grid.ac.uk - Escher is a Silicon Graphics Prism (IA64) with 8 Itanium 2 processors, 4 FireGL 3 graphics pipelines running SUSE Linux Enterprise Server 9 with Silicon Graphics ProPack 4
 - man4.nw-grid.ac.uk – Biruni is a Web server with Ganalia monitoring results.

Other Resources



- Daresbury
 - BlueGene L – 1000 processors, for software development, available soon.
- Liverpool
 - POL Cluster – 192x Xeon (32 bit), likely to become part of NW-GRID in April.
- Preston
 - 8-node SGI Altix 3700. Discussions underway with Dept. of Theoretical Astrophysics, U. Central Lancashire.