

The JANET Development Network

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UKERNA

Overview

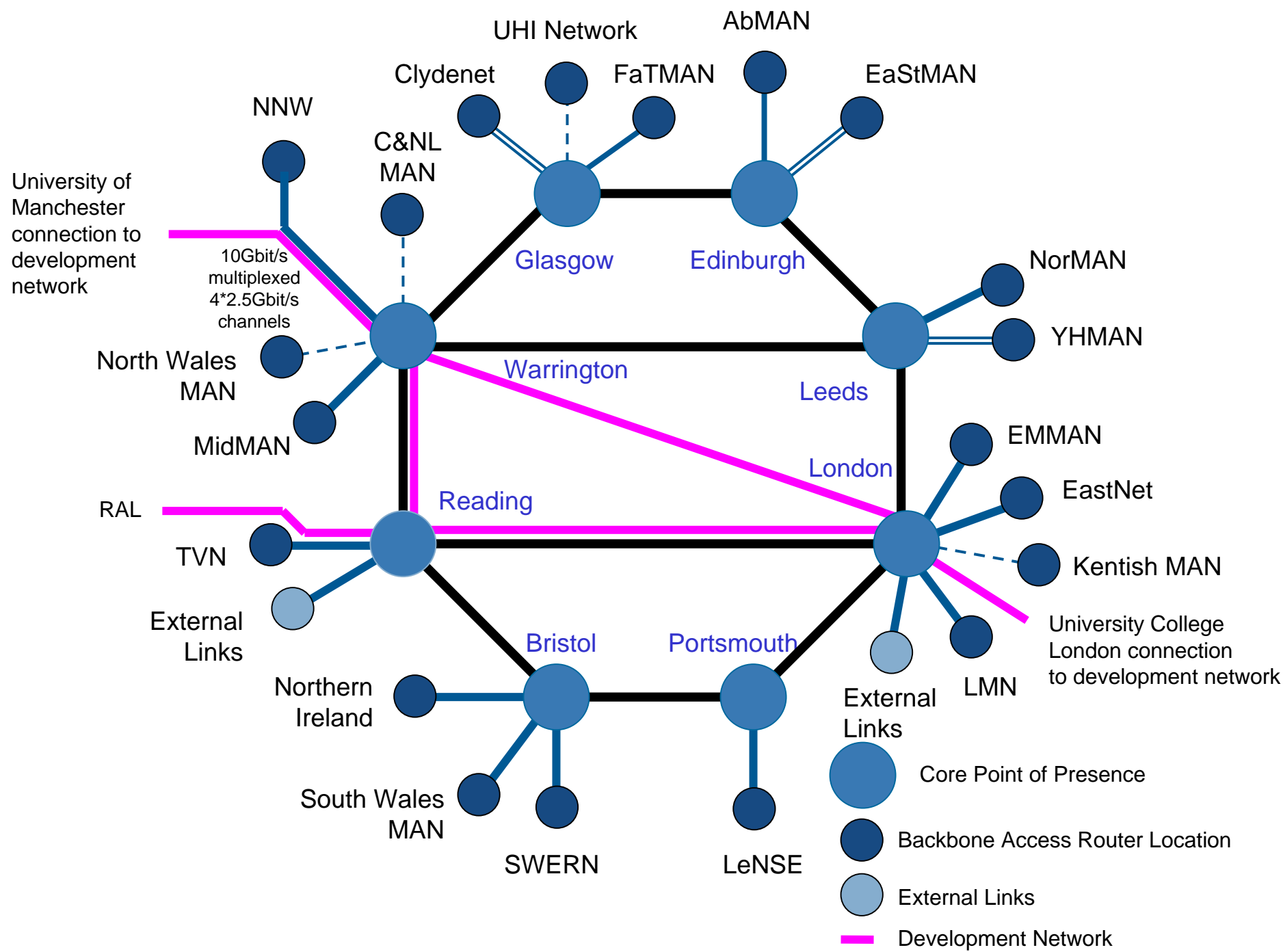
- Rationale for a SuperJANET Development Network
- Current Development Network
- Extending the Development Network
- Development access to SJ4 for Regional Networks

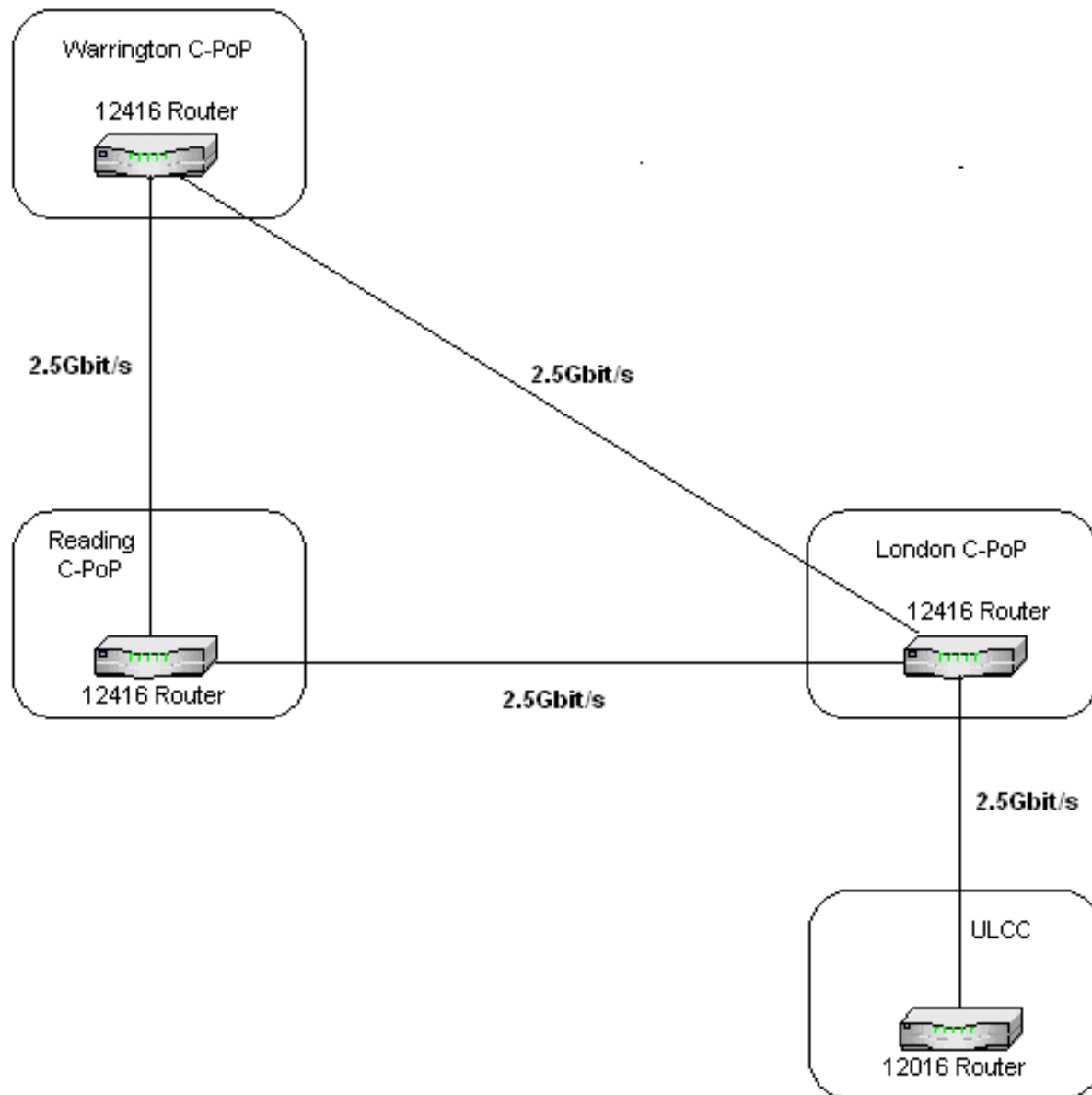
Why a Development Network ?

- Support development work incompatible with production network constraints
 - Perceived as too risky
 - Potentially disruptive
 - Availability
 - Limited time in Tuesday morning “at risk” period
- Support community R&D projects

Background

- History...
 - Had foreseen use in testing 10G SDH/DWDM with Worldcom prior to production use
 - Network expected to be 10Gb/s
 - 4 Locations – London, Reading, Warrington, Leeds
 - In practice – overtaken by pace of 10G developments
- What we have
 - 2.5 Gb/s network
 - 3 Locations - London, Reading, Warrington
 - Cisco 12416 at each
 - Linked through at Leeds – no JANET equipment





Operational Model

- Independent operation
 - Project controls the core development network and its own equipment
- JANET centrally operated
 - JANET Operations control the core network
 - Project controls its own equipment
- Access possible via JANET production network

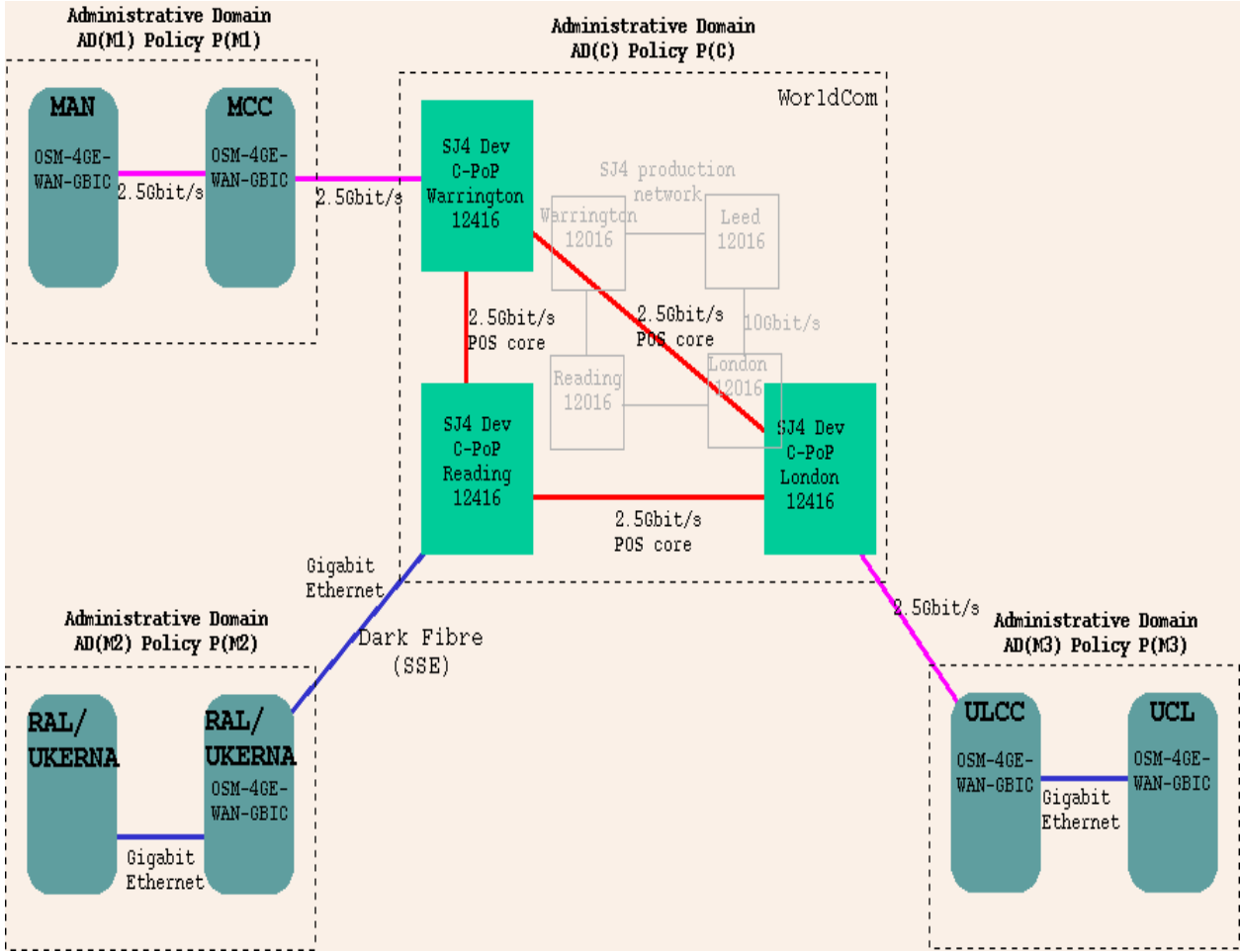
Using the Development Network

- Documentation on www.ja.net
 - SuperJANET Development Network Facilities
 - SuperJANET Development Network User Guide
- Applications via JANET Customer Service

Projects supported

- MB-NG Managed-Bandwidth (NG)
 - Investigate how an end-to-end IP “Managed Bandwidth” service might be engineered
 - Using QoS techniques with MPLS across multiple domains (campus, regional network, SJ Backbone...)
 - This kind of service currently seen as strategic to e-Science (however it is engineered)
- Some IOS Image testing – QoS features – JANET Network operations team

MB-NG



Issues with current network

- Limited scope (geographically)
 - 3 access points
 - London, Reading, Warrington
 - ULCC, RAL, Manchester
- Access is costly
 - long dedicated circuit may be needed
- Can we do better ?
 - Do we need to ?

Extending the Development Network

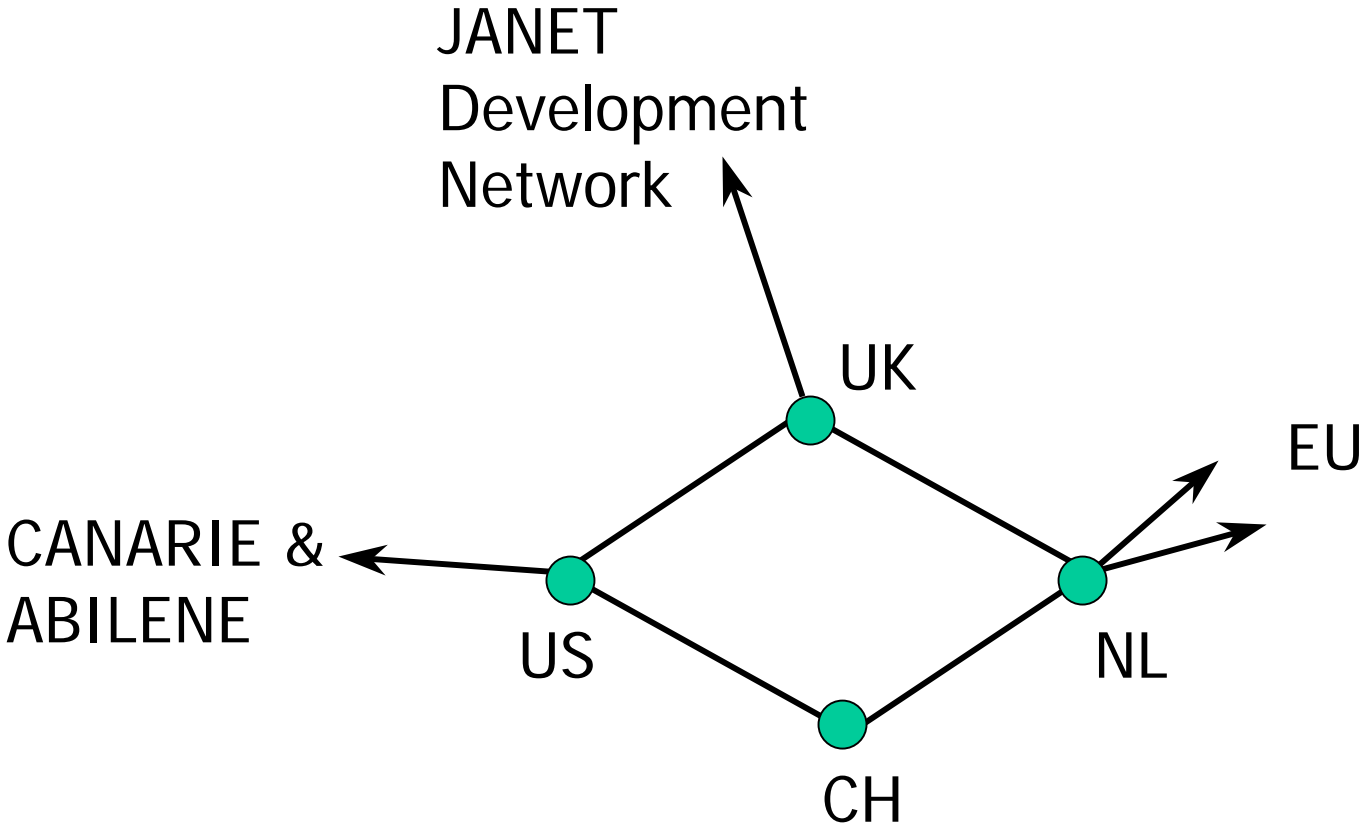
Extending the development network

- Why ?
 - Provide access to research groups with a demonstrable requirement
 - Network Research groups
 - E-Science
 - Others...
 - UKLight has really driven this issue
 - Access for project participants

UKLight

- Participate in International developments towards optical networking
- End-to-end provisioning of bandwidth channels
- Point-of-access in London connecting to
 - StarLight – Chicago
 - Netherlight - Amsterdam

UKLight



Extension model

- Uncommitted SJ backbone bandwidth in Worldcom contract
 - 10G for current production backbone
 - Additional 10G available but uncommitted
 - Paralell to existing core
 - Upgrades to BARs also included
- Presented as SDH
 - not dark fibre ...☹
- But it still opens up interesting options...

Principles

- Use SDH multiplexers to partition this bandwidth on a link by link basis
 - e.g. 10Gb/s → 4 x 2.5Gb/s
- Configure end-to-end paths using the partitioned links - channels
- Run IP/GE on channels
- Operating transmission equipment, will bring telco style provisioning issues
- May be relevant for future incarnations of JANET

Model for Extension of the SuperJANET Development Network

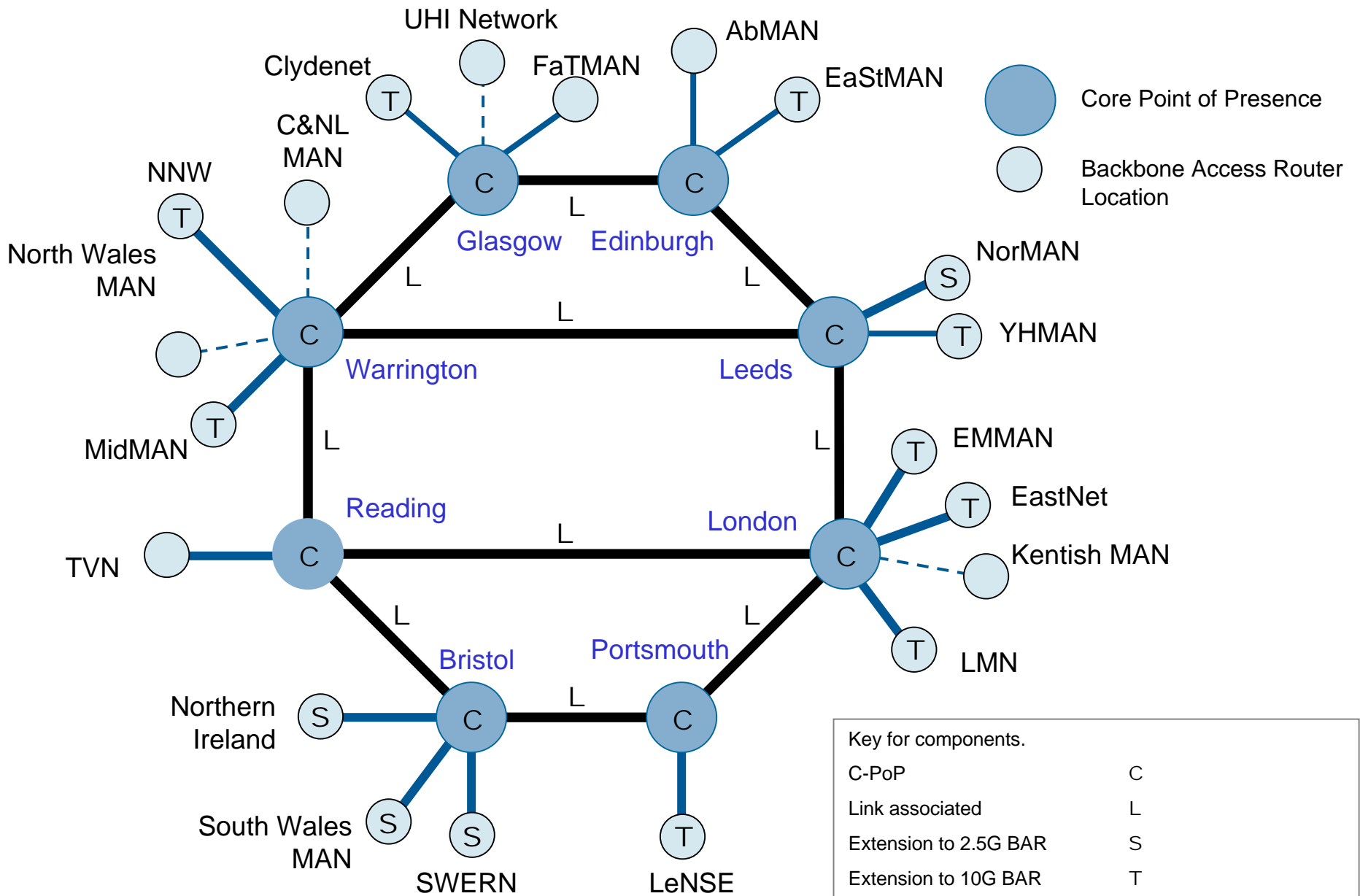
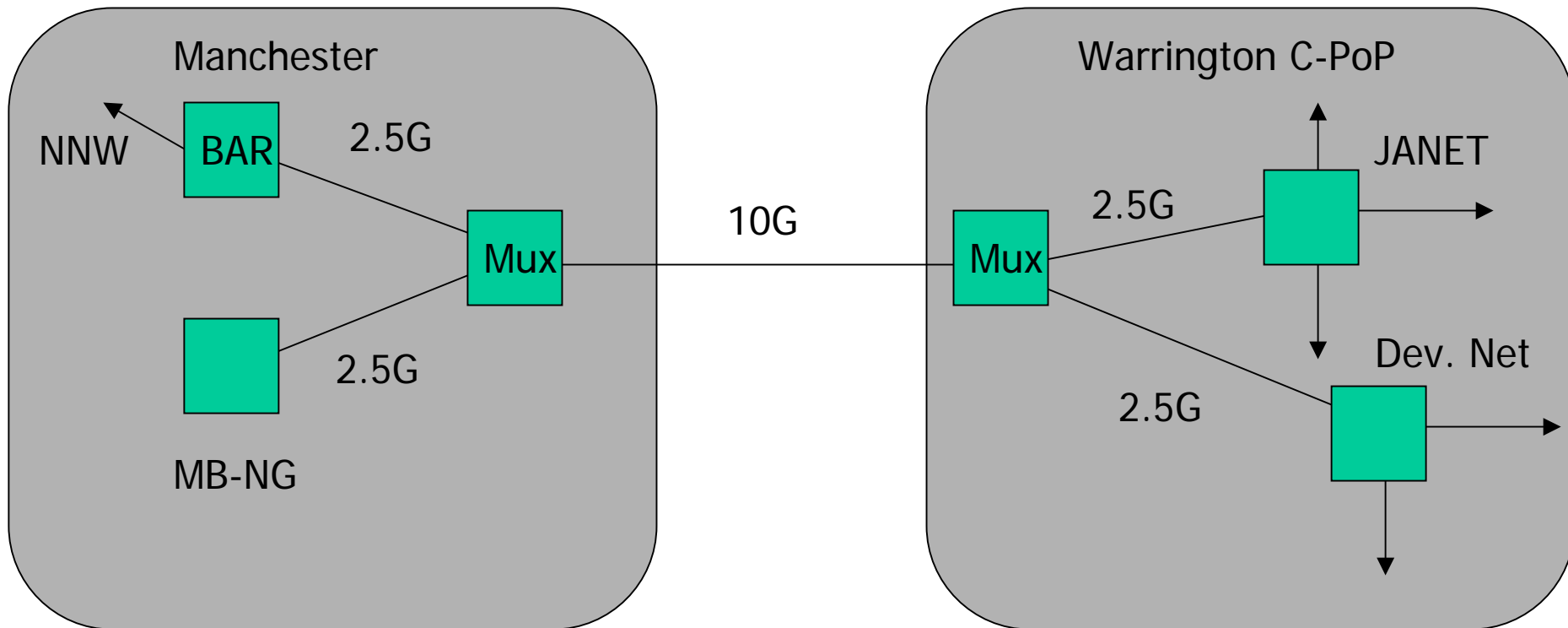


Diagram illustrating component oriented approach to costing extensions to the development network using uncommitted bandwidth within the SuperJANET Worldcom contract. Add costs for components C, L, S, and T for the combination of C-PoPs, backbone links and BARs required.

Existing example

- NNW – MB-NG link example
- Cisco 15454 is an integrated platform
 - SDH mux/x-connect & ethernet switch
 - Two are deployed on Manchester BAR link
 - JANET Operations have had interesting experiences with the management interface

SDH Multiplexing on NNW link



Other Factors

- Compatibility with future production use
 - Full/partially reversion to production
 - Engineer with this in mind
- Operational issues
 - Management access to devices
- Extend the model
 - Locations where no SJ4/Worldcom capacity exists
- Site access through RNs or direct to BARs

Development Connections for Regional Networks

RN Development connections

- Recent policy approved
- RNs can establish a development connection to BARs
- Involvement in JANET development programme
 - QoS, Multicast, IPv6...
 - RN must fund marginal costs for the connection
- Contact JCS if interested

Conditions

- Run on a spare FE (100Mb/s) port
- Completely independent of production service
- No SLA
 - Must not be used with production traffic
- Addressing & routing
 - Configured in isolation to the production service
 - Normally only 1 advertised prefix will be accepted for routing
 - RIPE rules still apply
 - May need to take a subnet from your existing allocation

Summary

- Current Development Network
 - Available now
- Ideas for extending the Development Network
 - will definitely be something for UKLight access
- RNs - separate Development access to production network