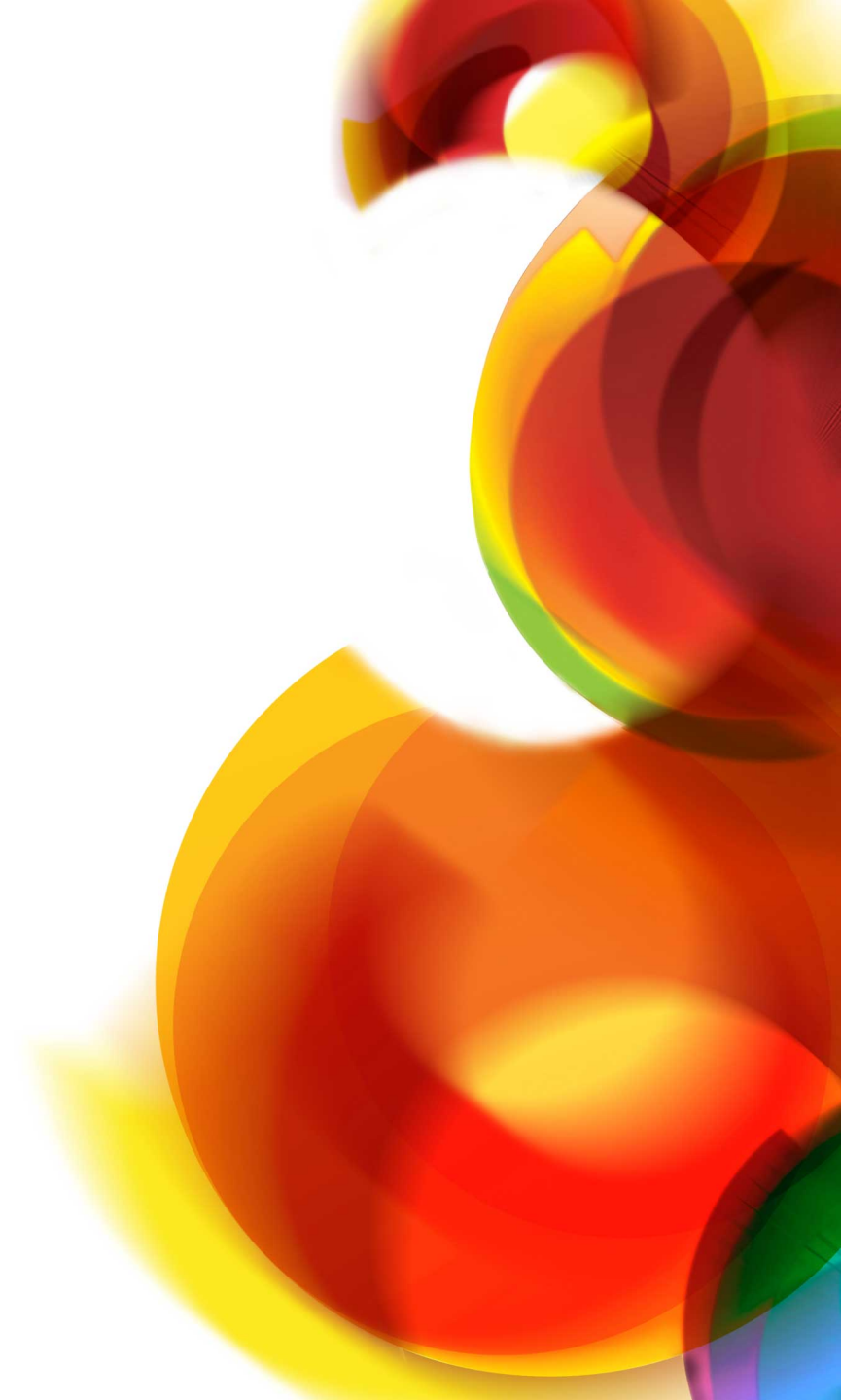


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# Janet Network Resilience

Dave Tinkler Janet NOC



- Definition of Resilience
- Janet 6 Core Resilience
  - Janet 6 Overview(Fibre and IP)
  - PoPs
  - Topology
  - Capacity
  - Equipment



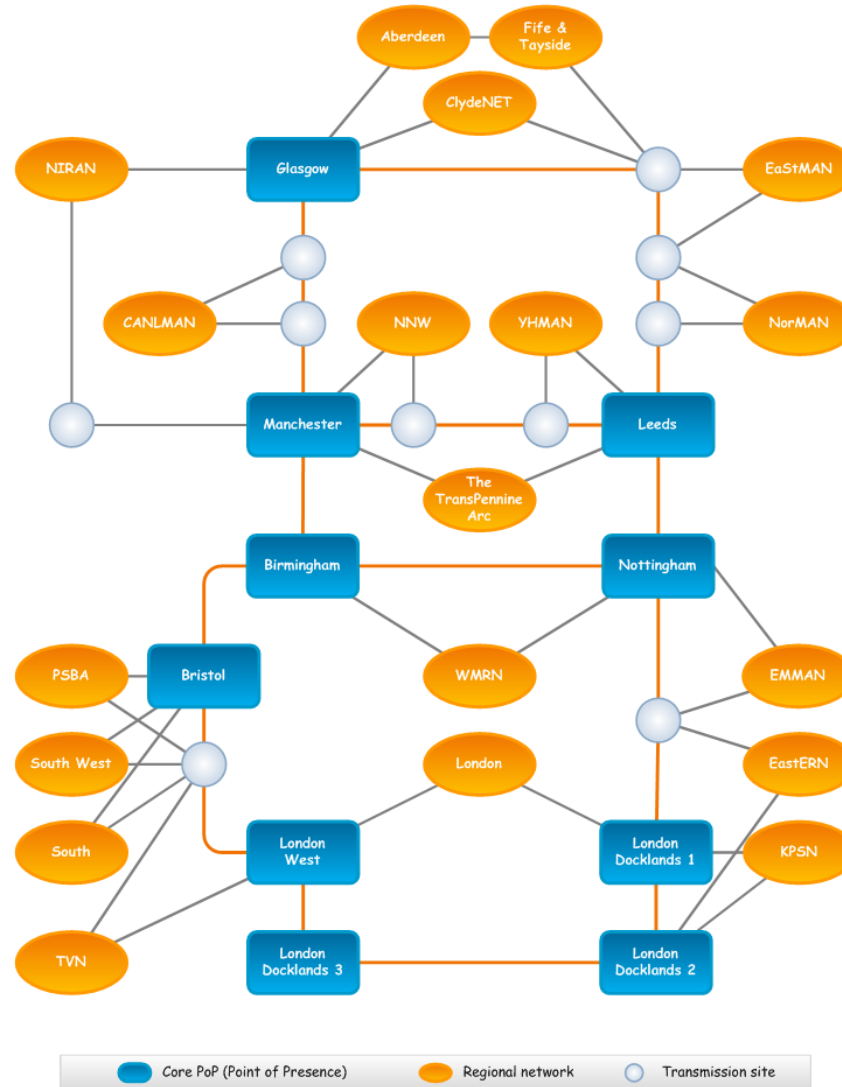
- The performance of the Janet IP Service is not affected by a single failure
  - Fibre duct or fibre
  - PoP power feed
  - PoP Environment
  - Equipment Component
    - Line Card
    - Power Supply
    - Processor
  - Internet Peering Router



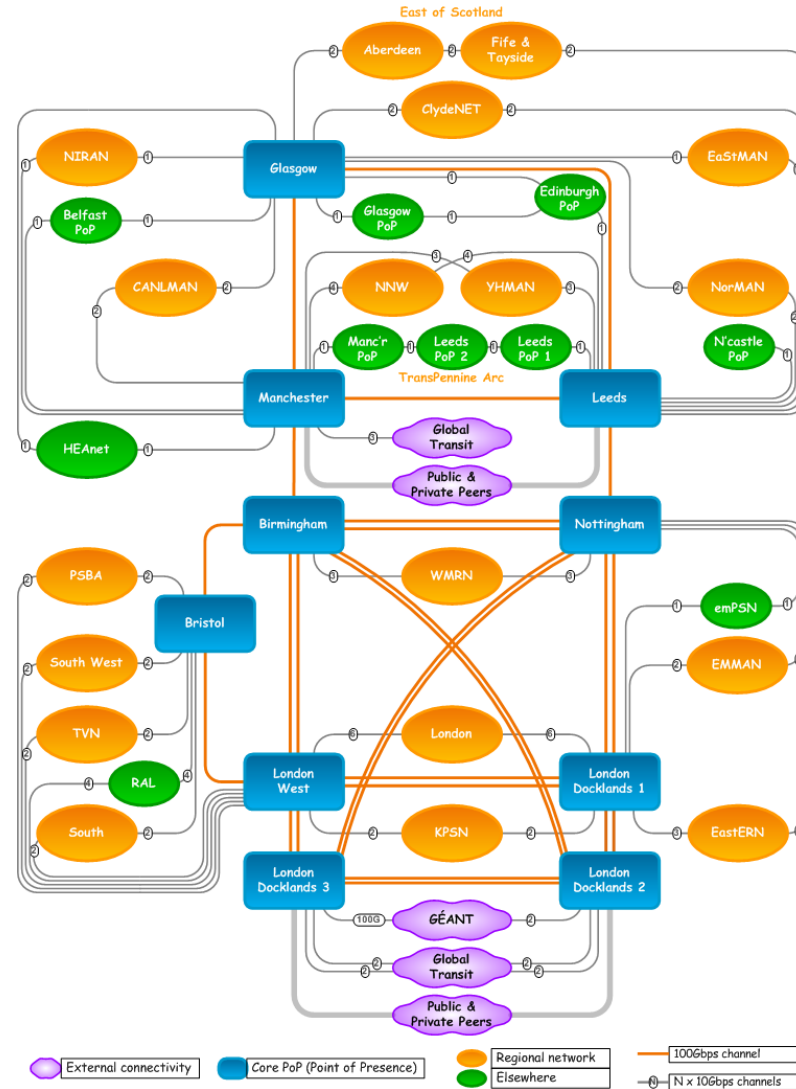
- Circuit Infrastructure
  - Dark Fibre
  - DWDM Equipment
    - Core PoP
    - Transmission PoP
    - Amplifier PoP
- Janet IP Service (JIPS)
  - Core Routers (Juniper T4000)
  - Core PoPs
  - Regional Network Entry Points (RNEPS)
    - 2 per region



# Janet 6 Fibre Network



# Janet 6 IP Network



- 
- Points of Presence PoPs
  - Topology
  - Capacity
  - Equipment



- Power
  - 2 independent power feeds of the required capacity
    - Core routers – 2 (6 X 100A DC)
  - Each feed has UPS and battery backup
- Cooling
  - Resilient Cooling of required capacity
    - Core PoPs 24Kw
    - Transmission PoPs 4kW
    - Amplifier PoPs 1kW
- Fibre Entry Points
  - Minimum of 2 physically diverse entry ducts

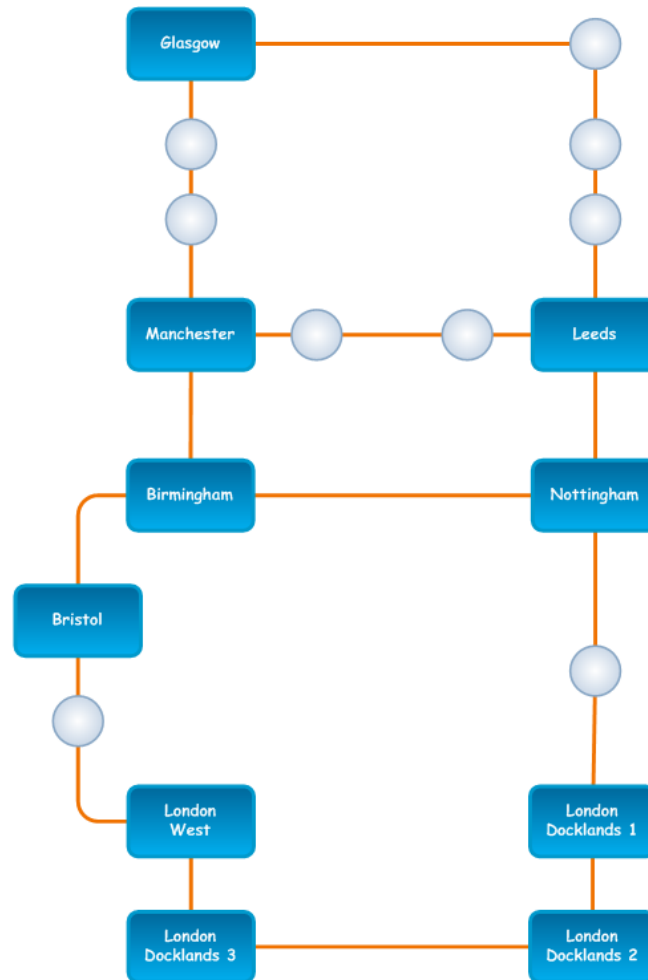




- Ring topology
  - Fibre
  - Circuits
- Each Regional Network connected to 2 core PoPs
  - Physically Diverse



# Janet Core Network – Ring Topology



Core PoP (Point of Presence)

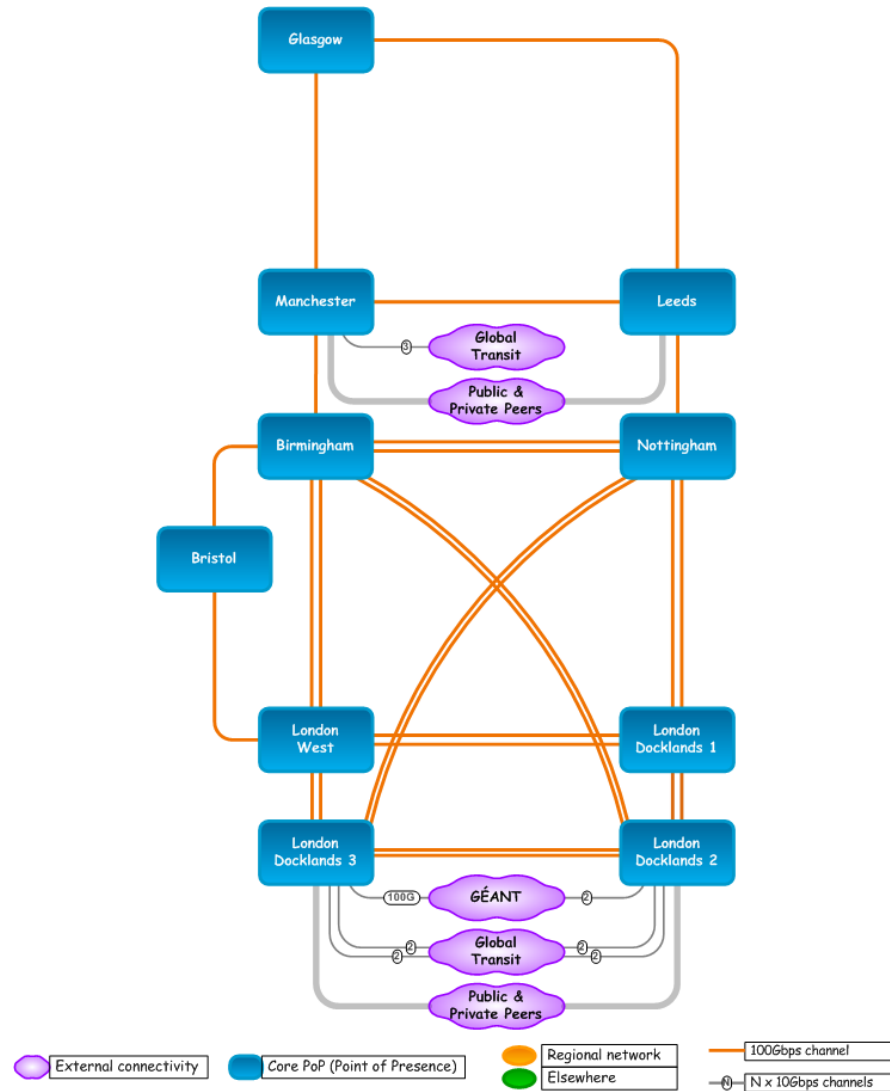


Regional network

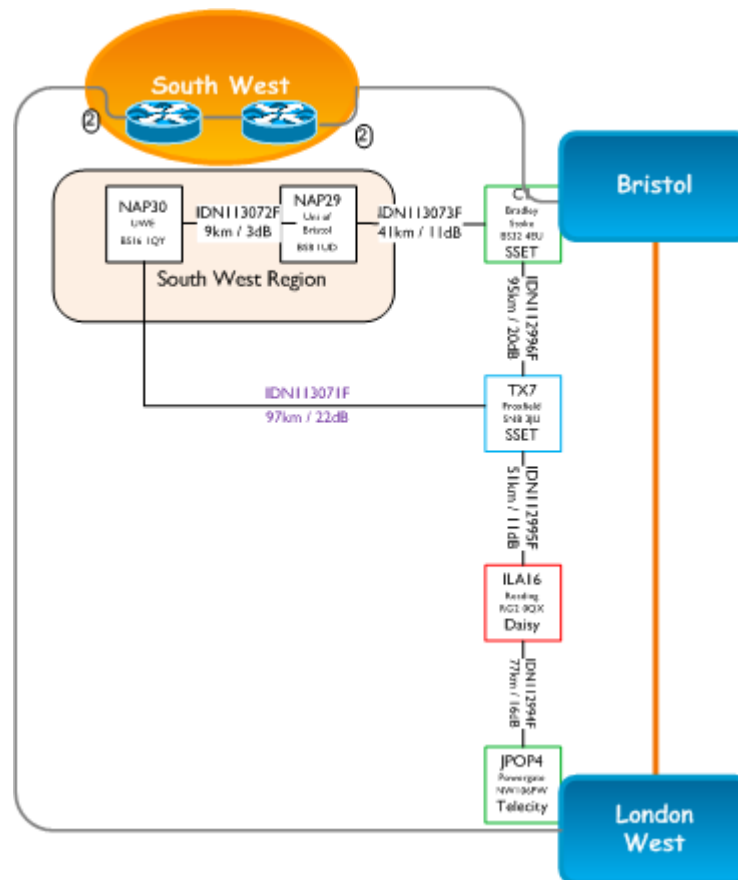


Transmission site

# Janet Core Network Resilience - Circuits



# Janet Core Network—Regional Network Connection



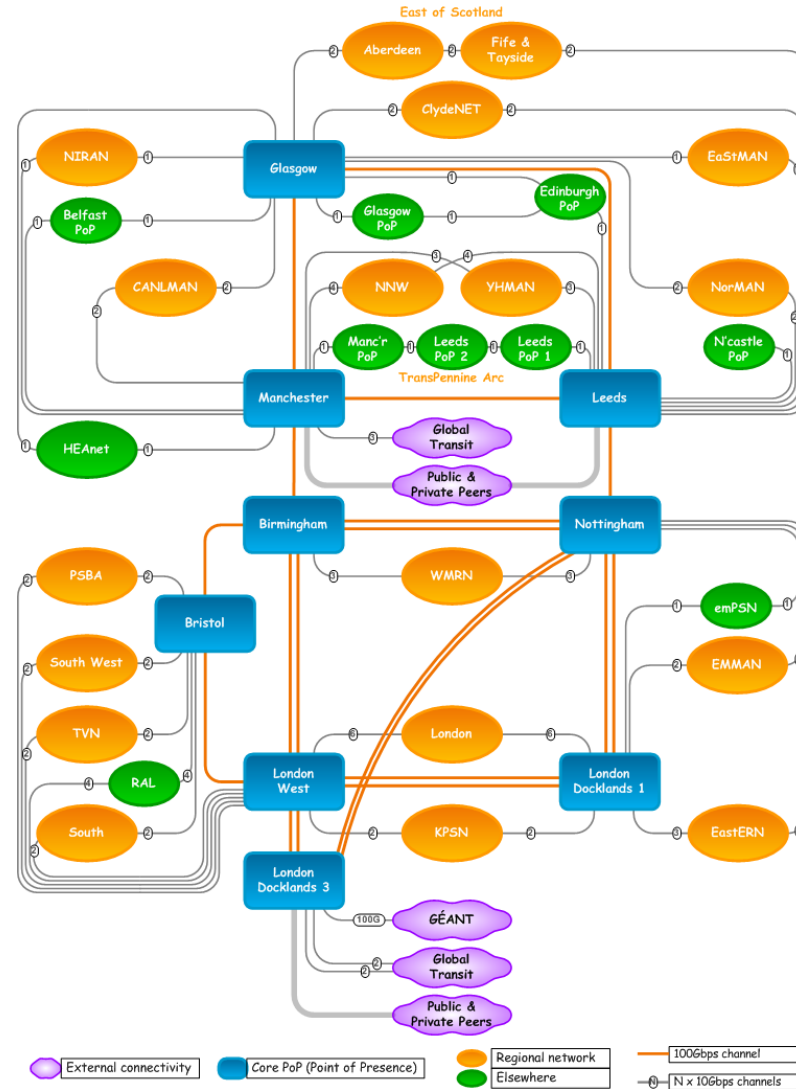
- Multiple Internet Peering Points

PoP	Global Transit	Public Peerings	Private Peerings
London Docklands 2	40Gbps	40Gbps	80Gbps
London Docklands 3	40Gbps	40Gbps	80Gbps
Telecity Manchester	30Gbps	10Gbps	40Gbps
Leeds	-	1Gbps	-

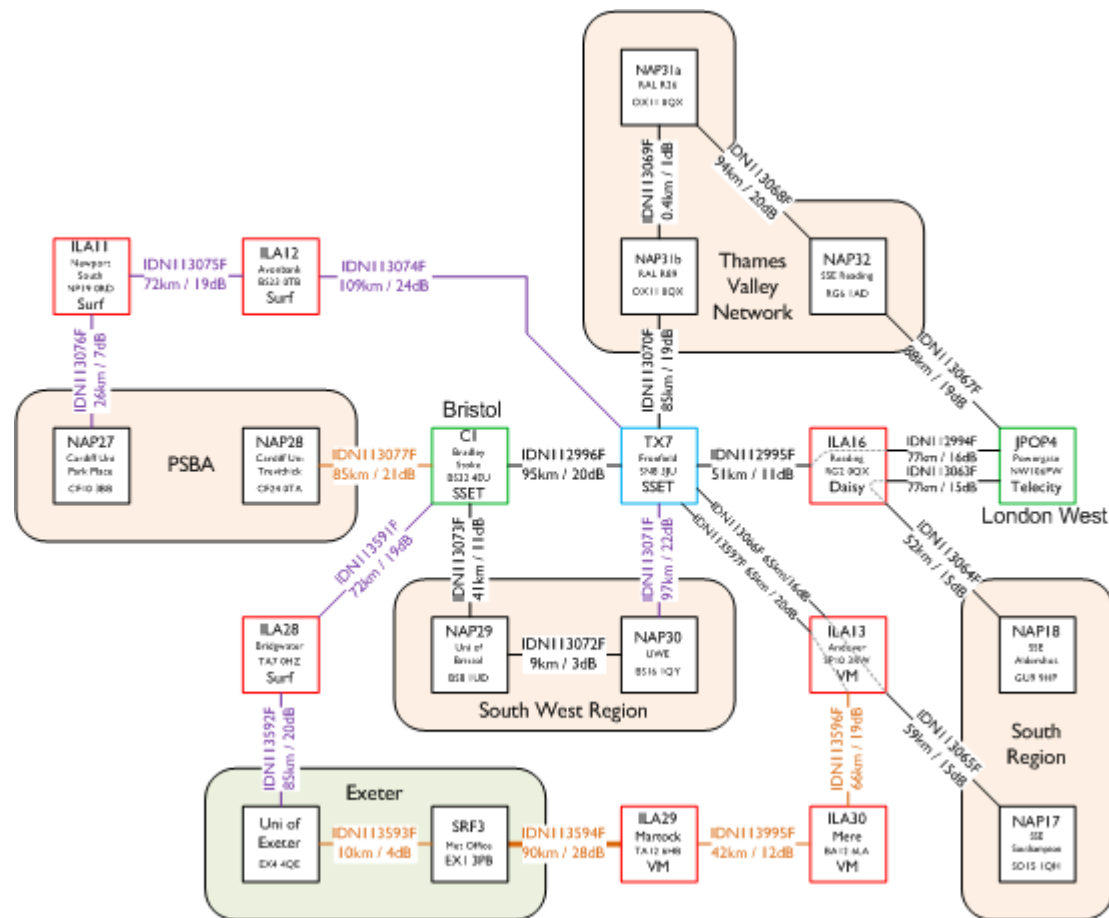
- Peering capacity in both Docklands PoPs to cope with core router failure
- Redundant capacity for fibre breaks
  - Traffic flows South to North
  - East-West links for traffic resilience



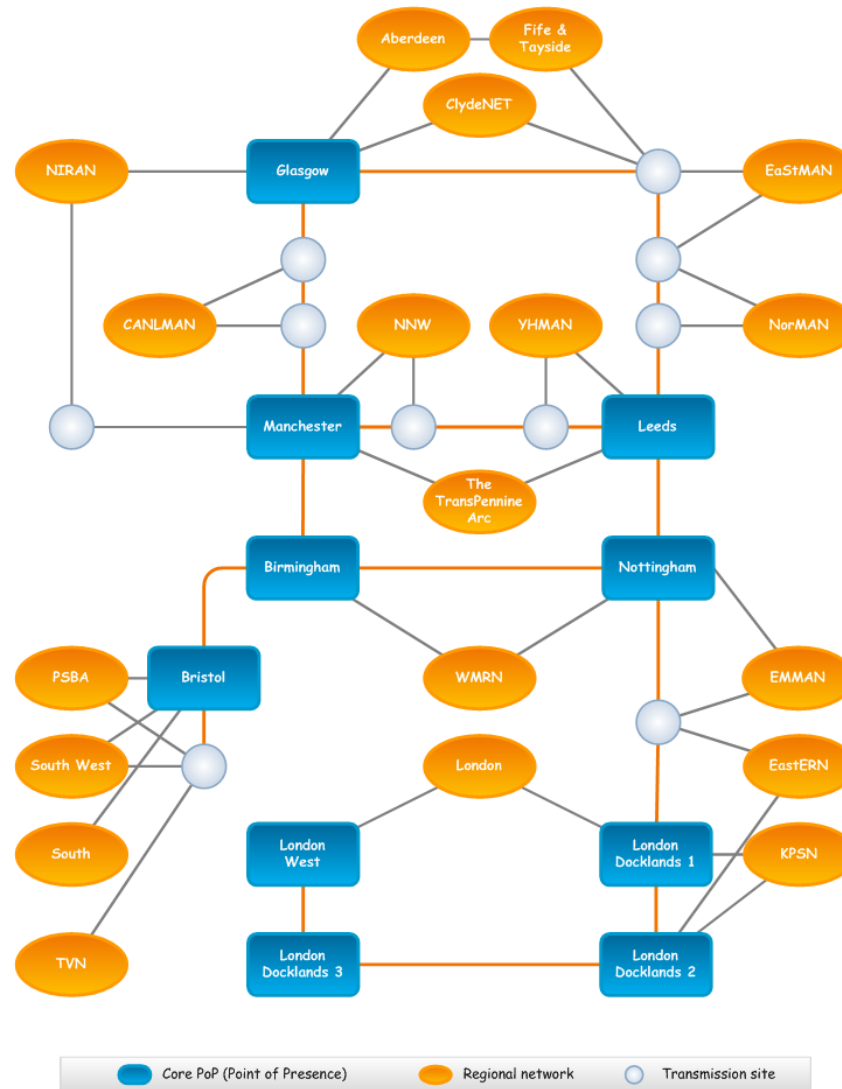
# Janet Network Resilience – Peering Router



# Janet Network Resilience – Duct/Fibre Failure

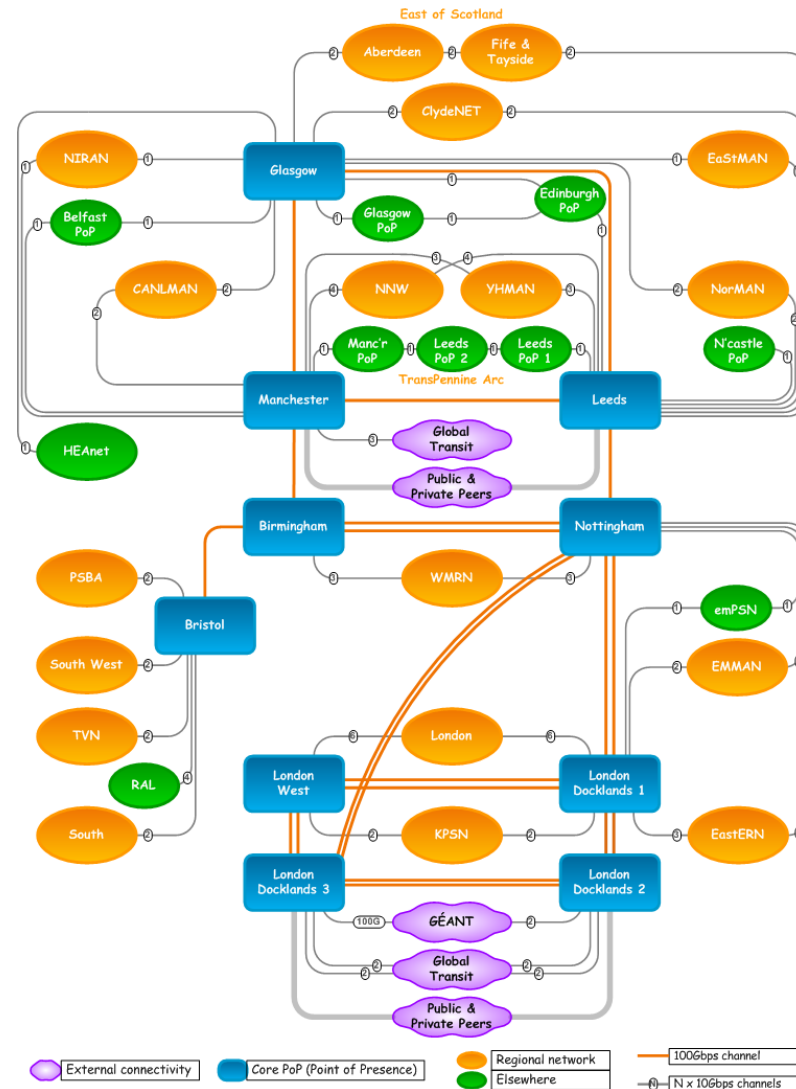


# Janet Network Resilience Duct/Fibre Failure





# Janet Network Resilience – Duct/Fibre failure



- Routing Equipment
  - Dual Power Supplies
  - Dual processors
    - Non-stop routing
    - Graceful switchover
  - Different Line cards per direction
- Optical Equipment
  - Dual Power Supplies
  - Dual processors
  - Different shelves per ‘fate sharing’ direction



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- Janet 6 Core Resilience
  - Points of Presence PoPs
  - Topology
  - Capacity
  - Equipment
- Questions

