

MPLS – the BT Experience

IEEE CQR

8th June 2006

Dr Martin Aylett
martin.aylett@bt.com



Outline

MPLS – the BT experience

- Scope of BT's MPLS platform
 - BT's UK and global MPLS IP VPN platform
 - History and current constraints
 - Future plans
- Quality and Reliability
 - Fast convergence
 - High availability features
 - Dual Active Flows
 - Future plans

BT's MPLS-based IP VPN platform



MPLS in BT

- Expertise:
 - experience since 1997
 - work very closely with vendors
- Comprehensive testing:
 - ad-hoc testing plus network integration models
- Carrier-class OSS
 - To allow rapid growth
- CESG accredited security

BT's MPLS IP VPN platform

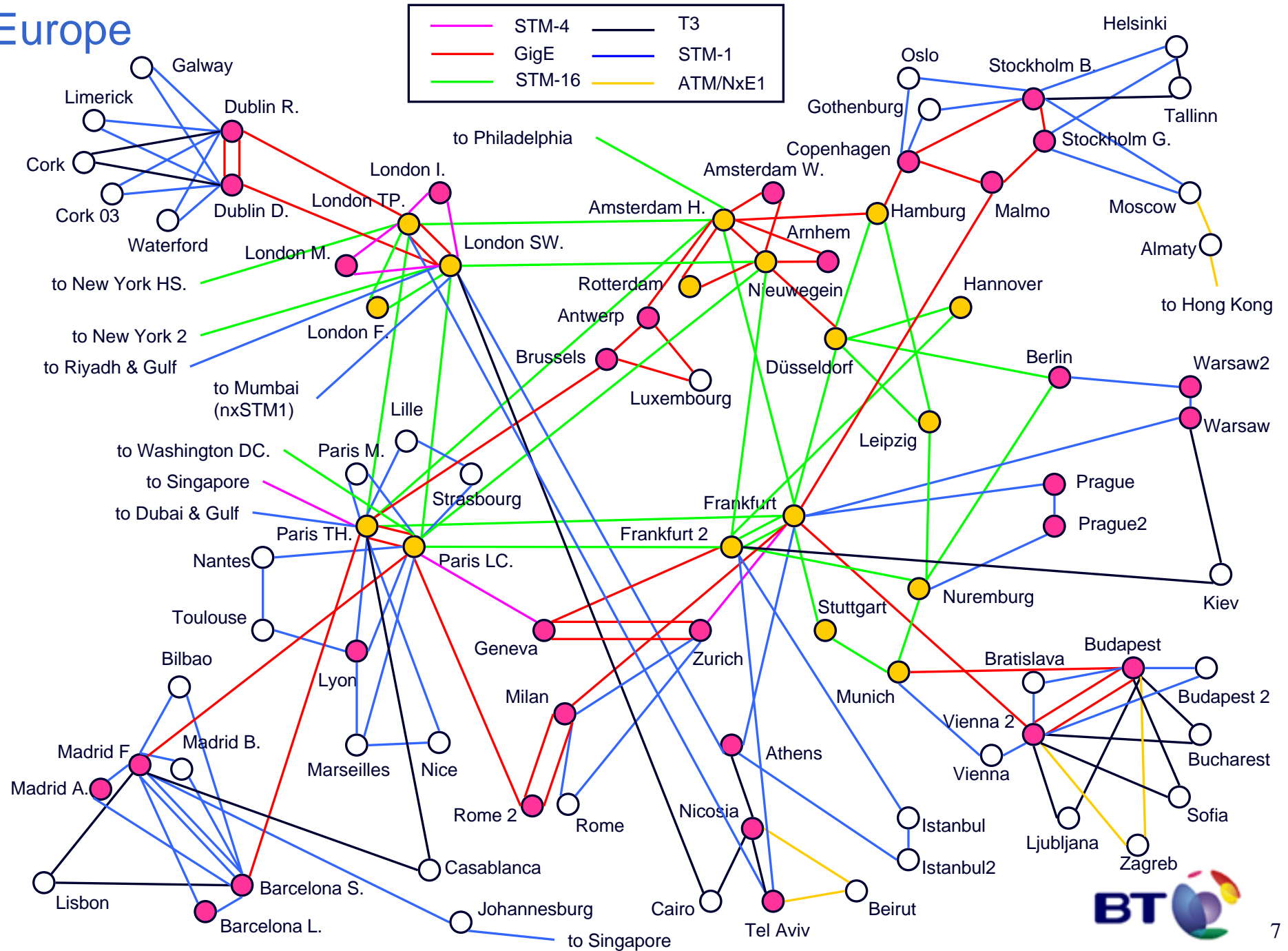


- >73,000 Ports
- 34 PoPs + 25 LTAPs
- nx2.5G core
- >1,200 PE routers
- >150,000 prefixes

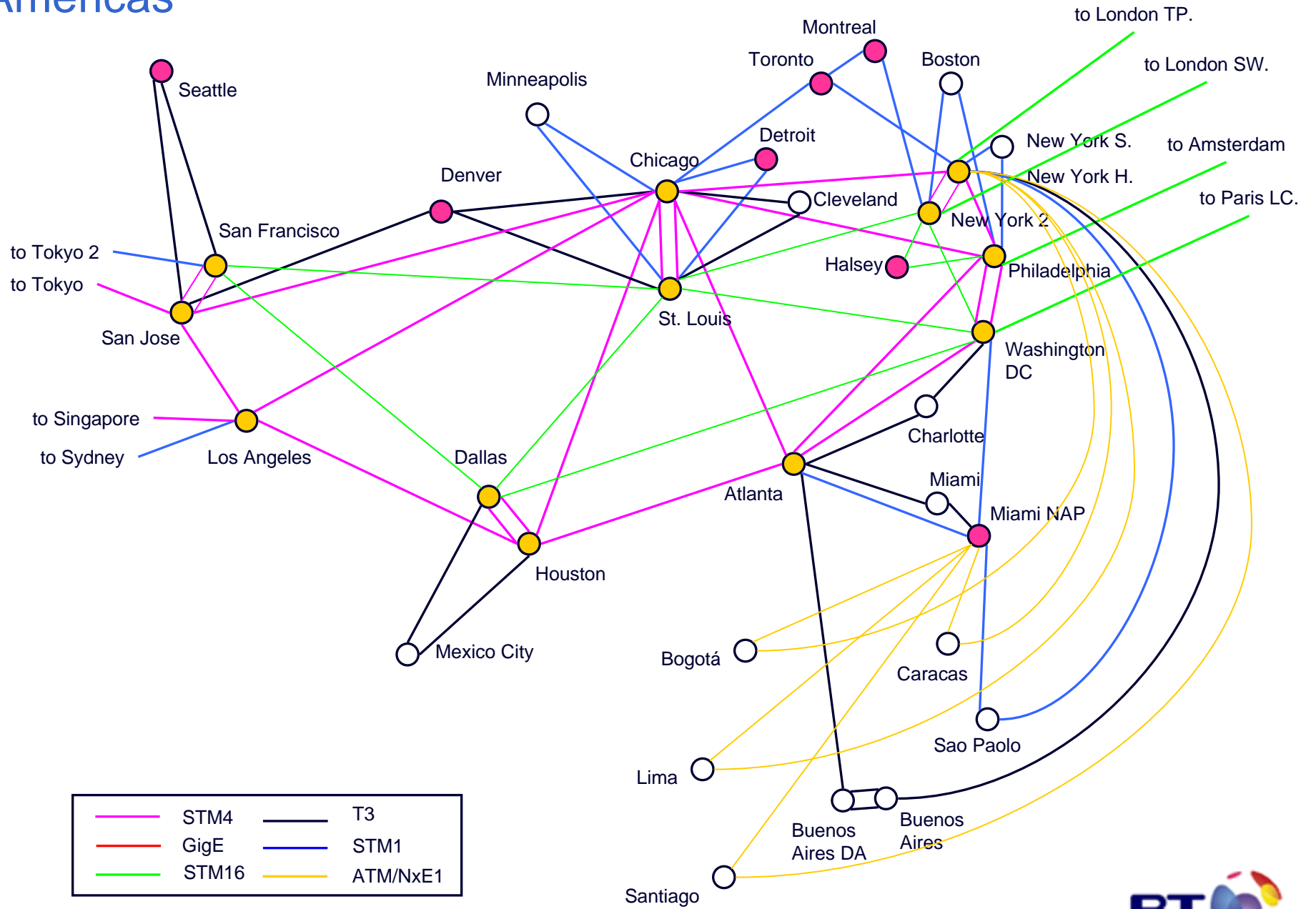


- >24,000 Ports
- 124 PoPs
- 45M to 2.5G core
- >1,000 PE routers
- >220,000 prefixes

Europe

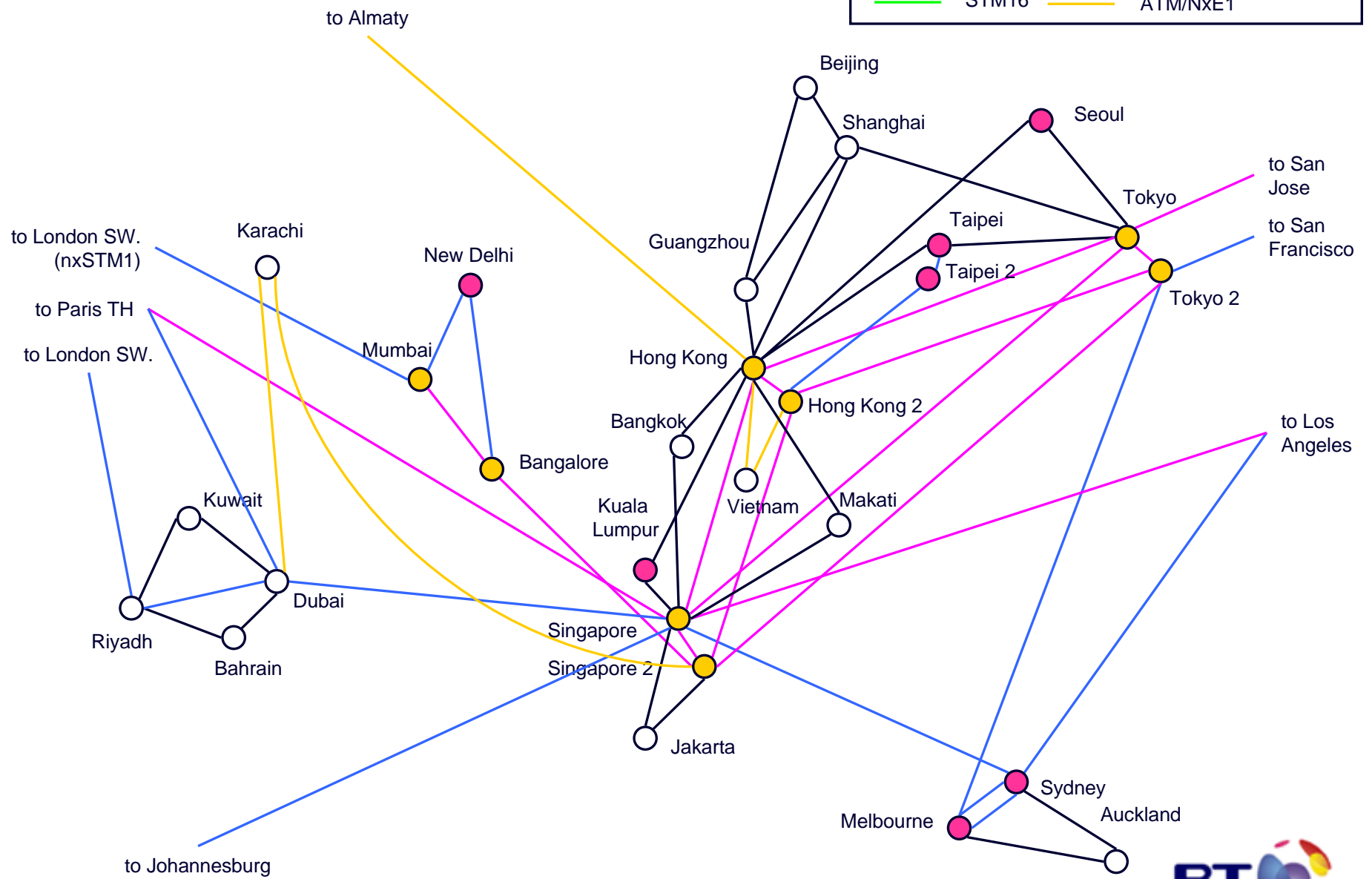


Americas

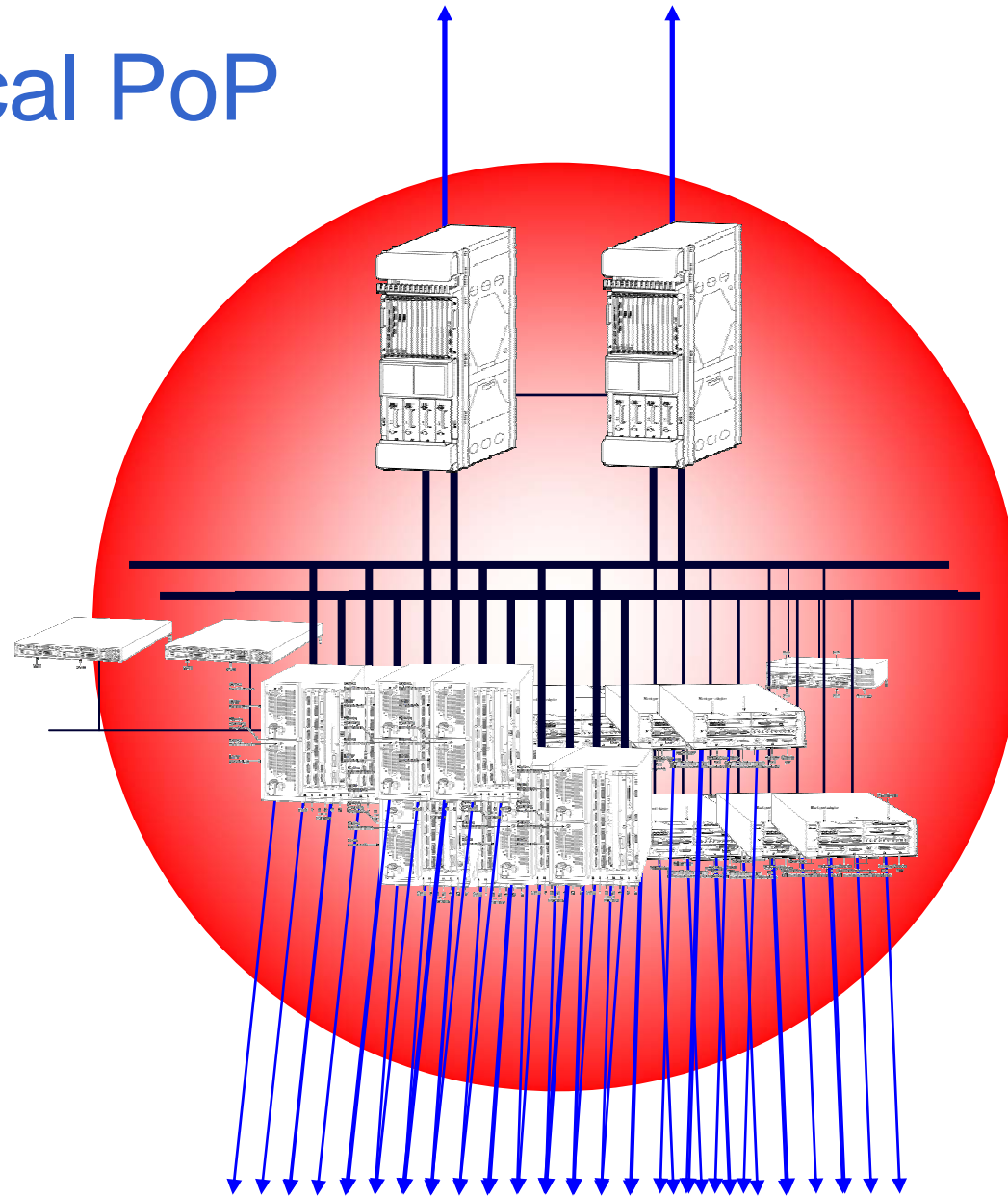


Asia-Pacific and Middle East

— STM4	— T3 / >32M ATM
— GigE	— STM1 / >64M ATM
— STM16	— ATM/NxE1



Typical PoP



That's all!



Constraints

Large, diverse installed base of routers and switches

- P and PE routers, PoP switches:
 - Cisco: 7204VXR, 7206VXR, 7304, 7507, 7513, 10008, 12012, 12410, 4506, 6006, 6506, 6509
 - Juniper: M320
- Plus route reflectors, SAA routers

Availability of all required features

- Especially on PE routers
 - QoS, MPLS VPNs, DSL, etc, etc, plus HA

Future plans

BT's 21C network

- MPLS at the heart of 21C
- Single network for all services
 - Voice
 - VPNs
 - Internet
- Single OSS stack
- Very large scale

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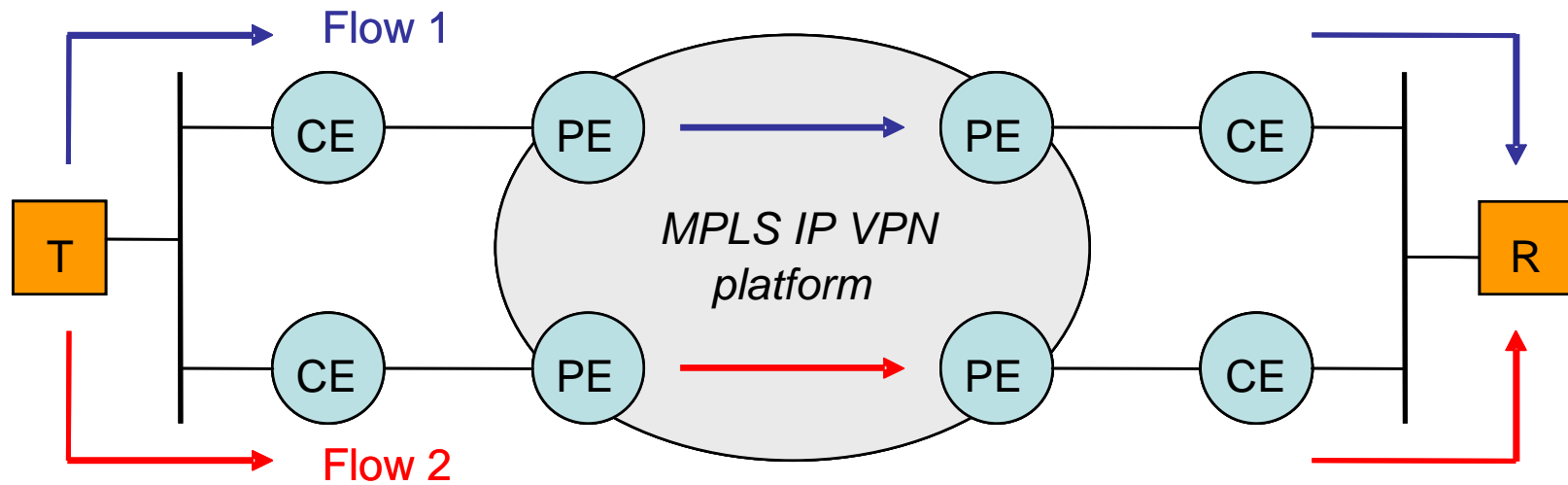
Fast convergence

- OSPF
 - Tune hello and dead timers
 - Tune throttle timers
- BGP
 - Tune minimum advertisement interval
- Carrier-delay
- FR EEKs

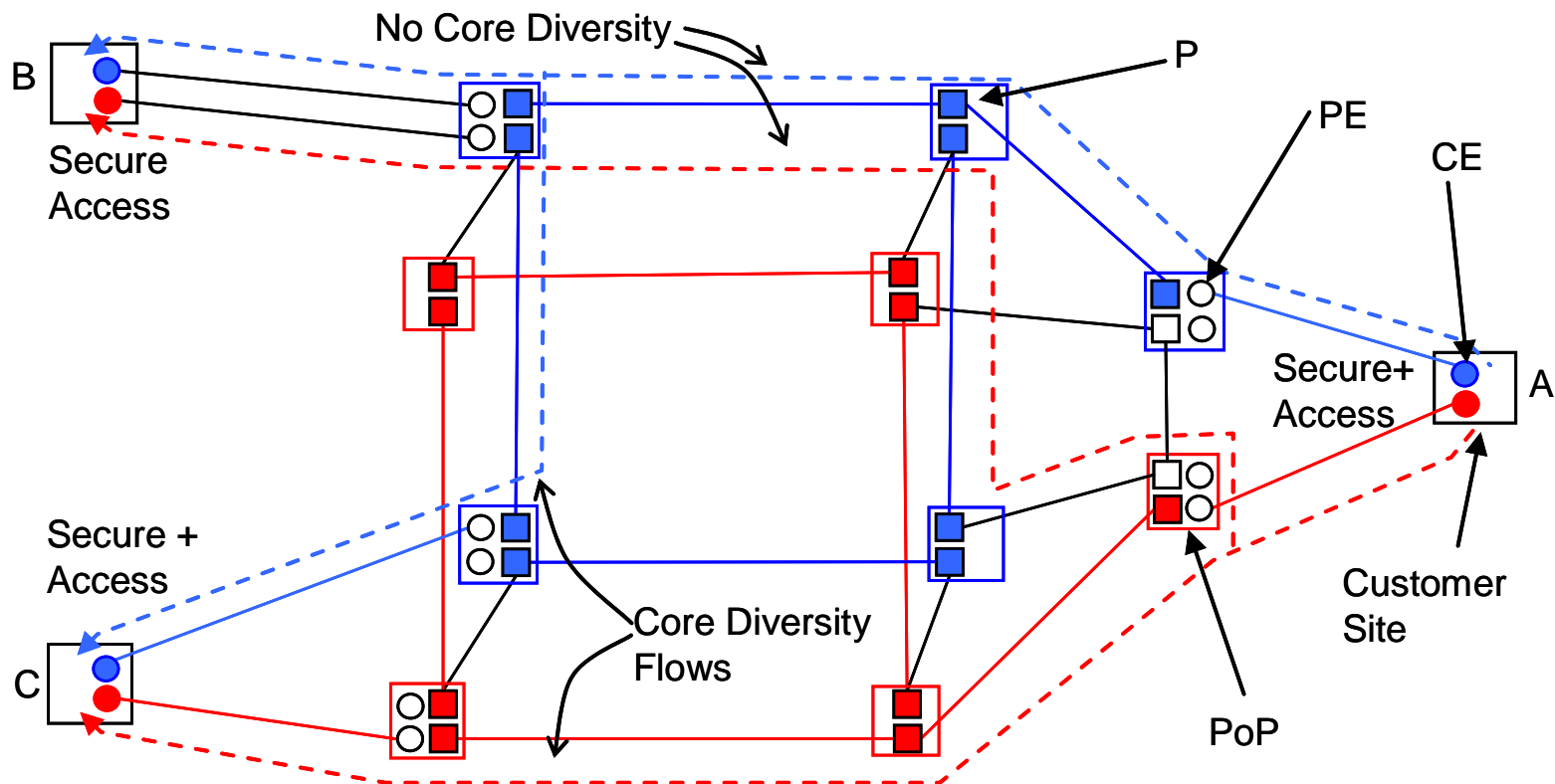
HA features

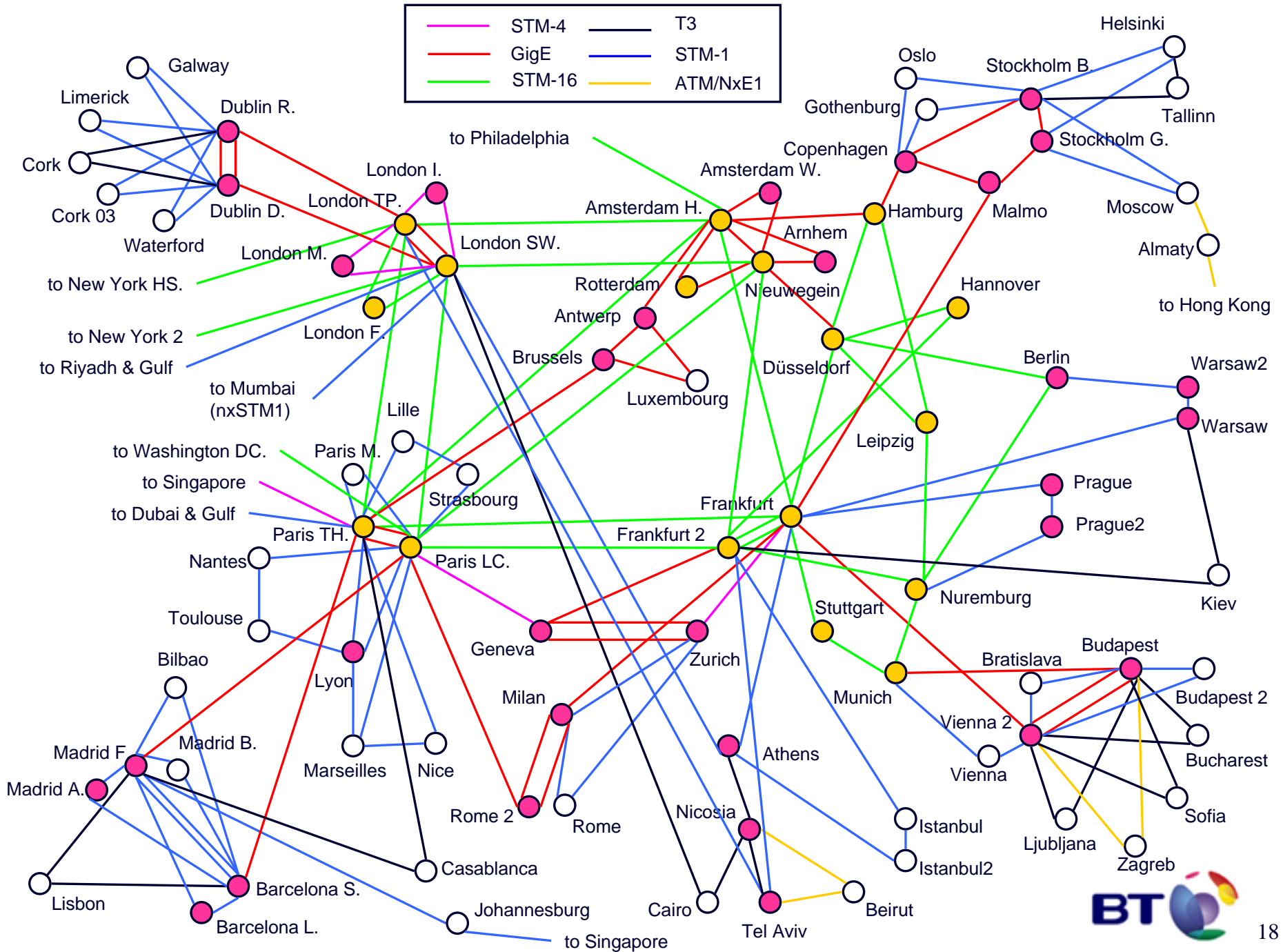
- NSF
 - For OSPF on 10k PE routers
- BGP graceful restart
 - On 10k PE routers
 - On Route Reflectors
- LDP graceful restart
 - On 10k PE routers
 - On P routers
- ISSU (in-service software upgrade)
 - For 10k PE routers

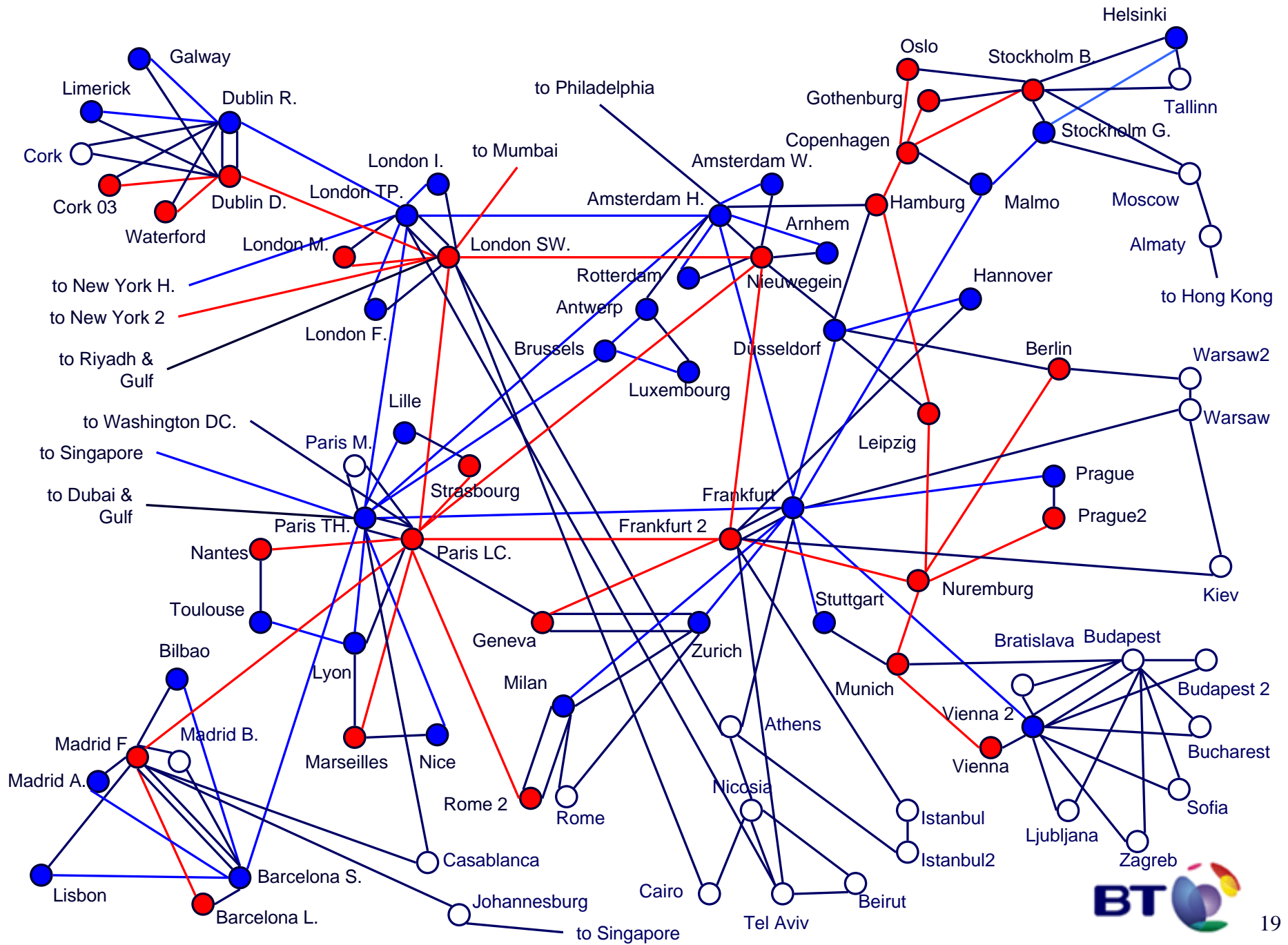
Dual Active Flows



Dual Active Flows







Future plans

- Take advantage of more HA features
- Continue migration to HA-capable PE routers
 - For instance Cisco ESR and GSR
- Extend coverage of Dual Active Flows
- Consolidate everything onto BT's 21C network
 - With MPLS at its heart

