



Journey from Service Provider to Infrastructure Player

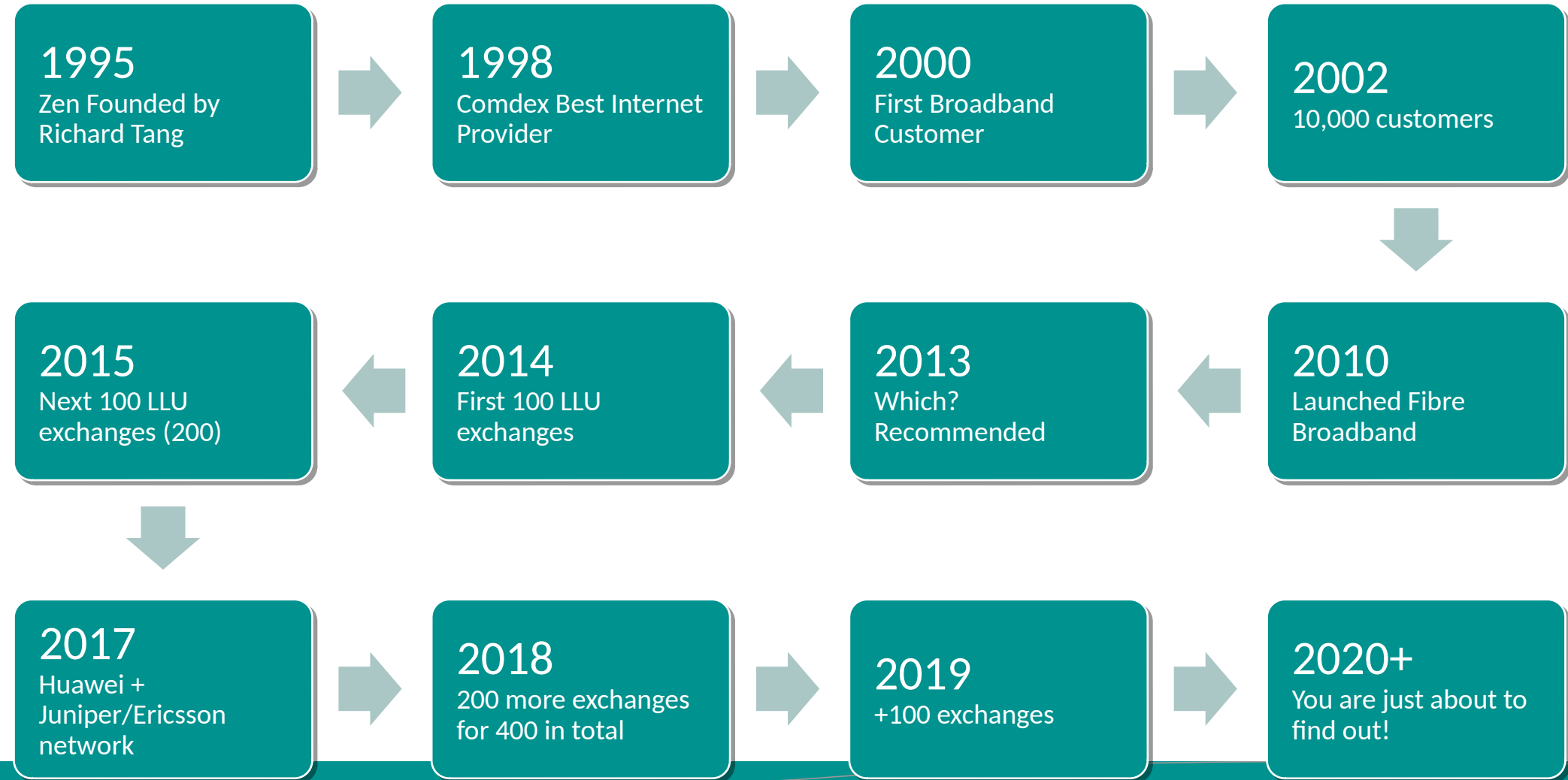
UKNOF43 April 19

Richard Shaw

About me

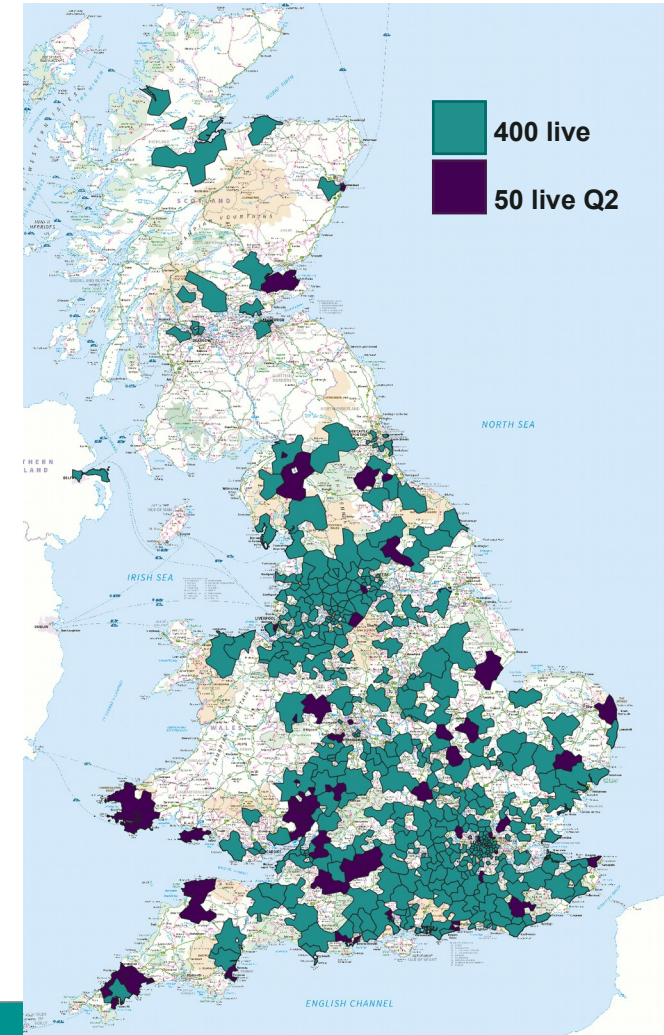
- Richard Shaw
- Lead Engineer – Network Operations

Our journey so far

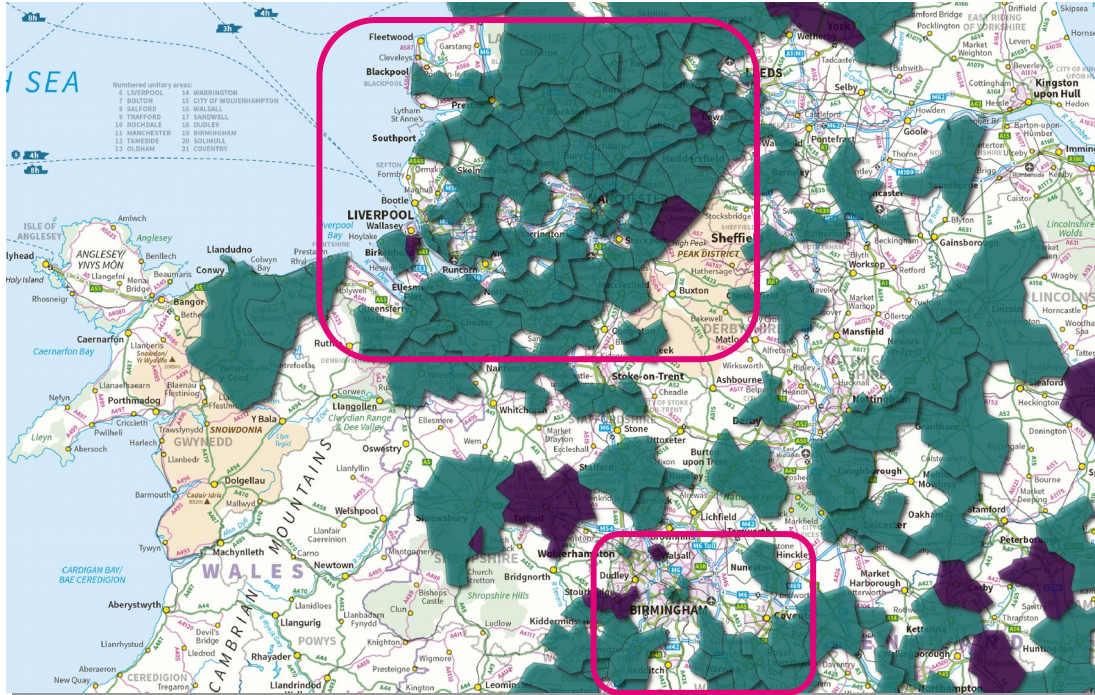


Our infrastructure build approach so far

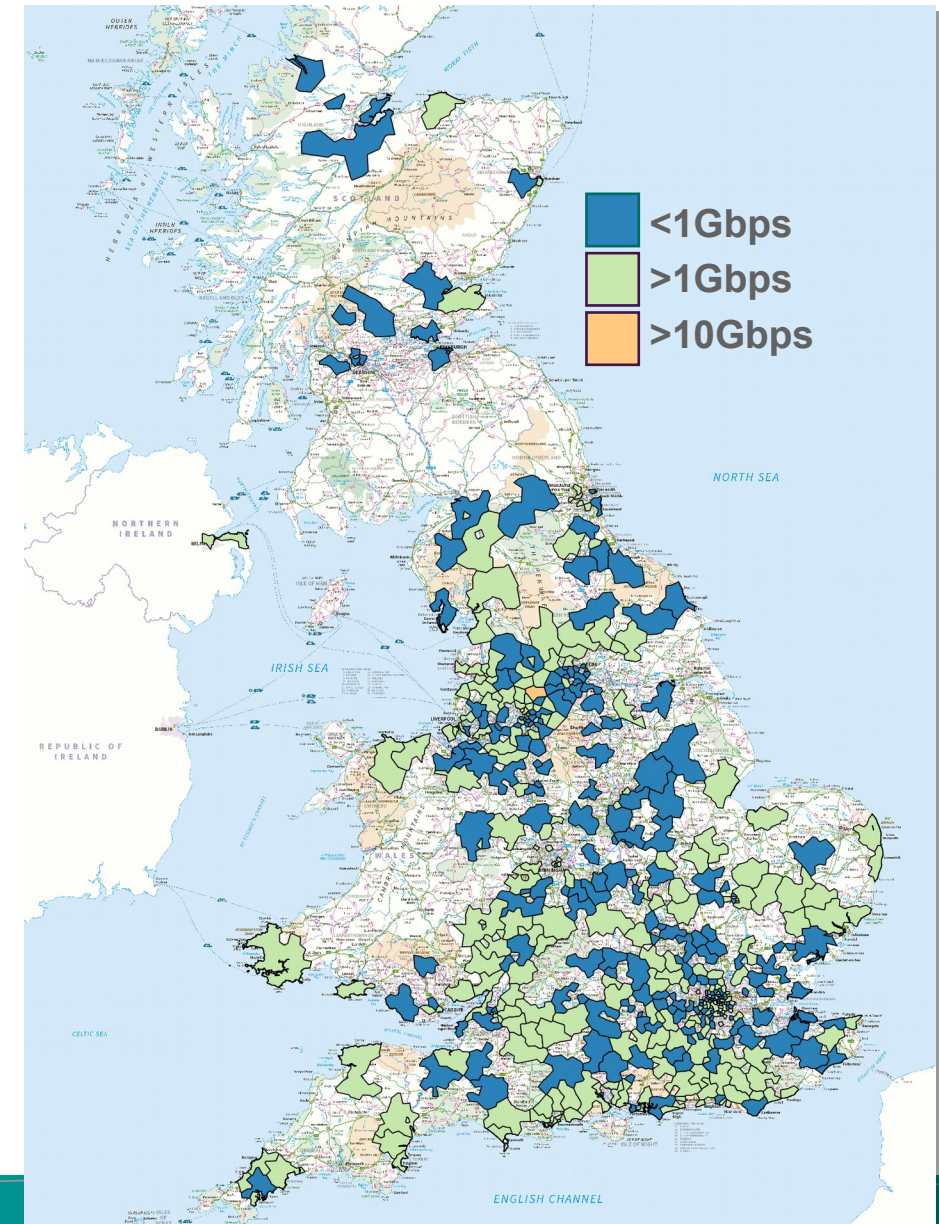
- Based on existing customers and prospect data
- Skewed to residential and small business
- 400 exchanges that gives us ~55% FTTx coverage
- Another 50 being unbundled which gets us to >65% coverage
- Of those 400, 275 have EAD based services live



Some interesting side effects

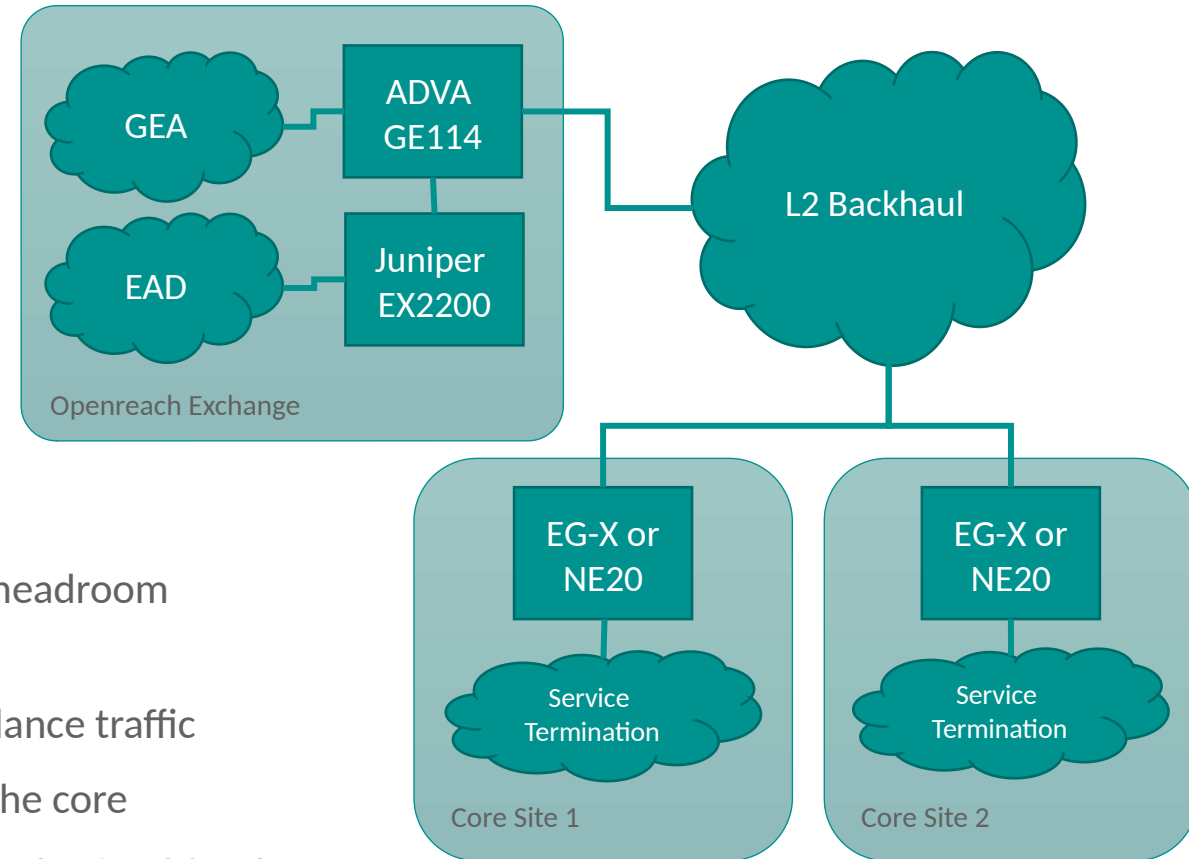


- Most of Manchester & surrounding areas are very well covered
- Very few exchanges in Birmingham



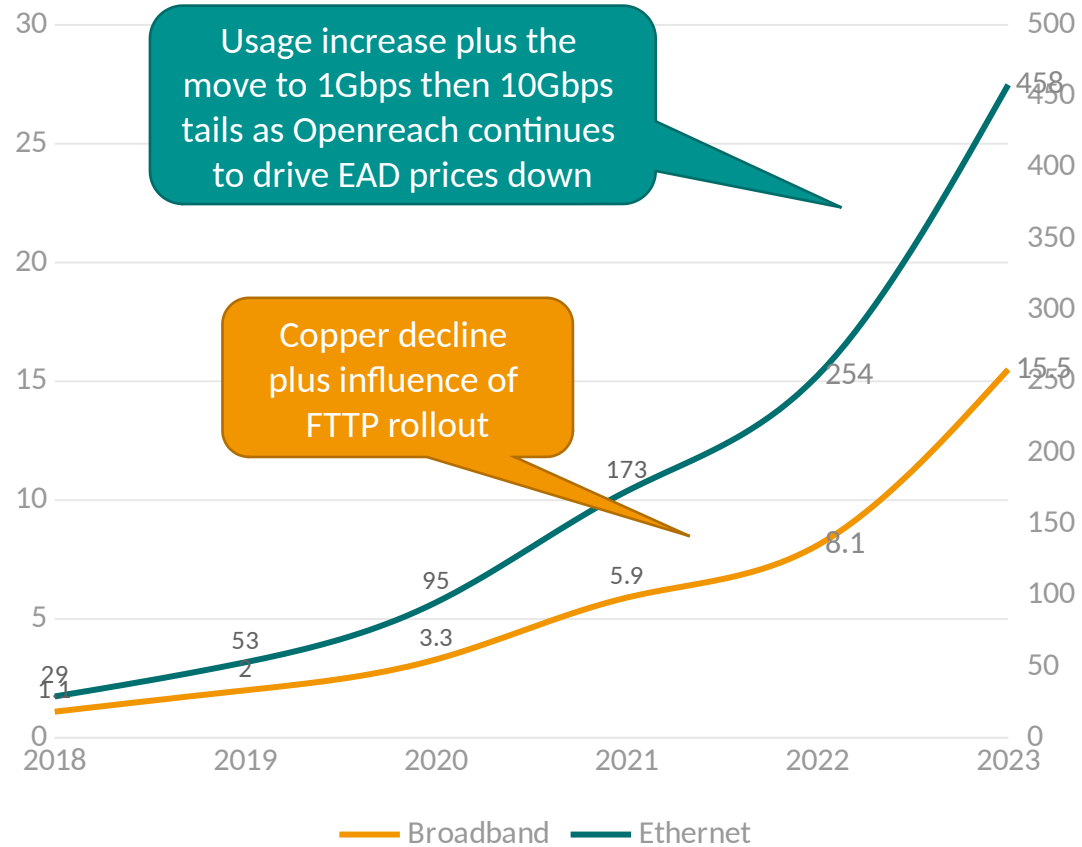
Our current network architecture

- 'Flat' L2 between Exchange and Core
- Multi-vendor Core/Agg/BNG/LNS makes life a bit 'interesting'
- Two main core sites – London and Manchester
- Our current issues:
 - Scaling is difficult
 - Mixing traffic types is very hard
 - Capacity has to be managed on always ensuring enough headroom (although that means everyone 'never loses a packet')
 - No ability to use multiple backhauls from exchange to balance traffic
 - Caching and other network functions have to happen in the core
 - All traffic either goes to London or Manchester, even if it's destined for the 'exchange next door'

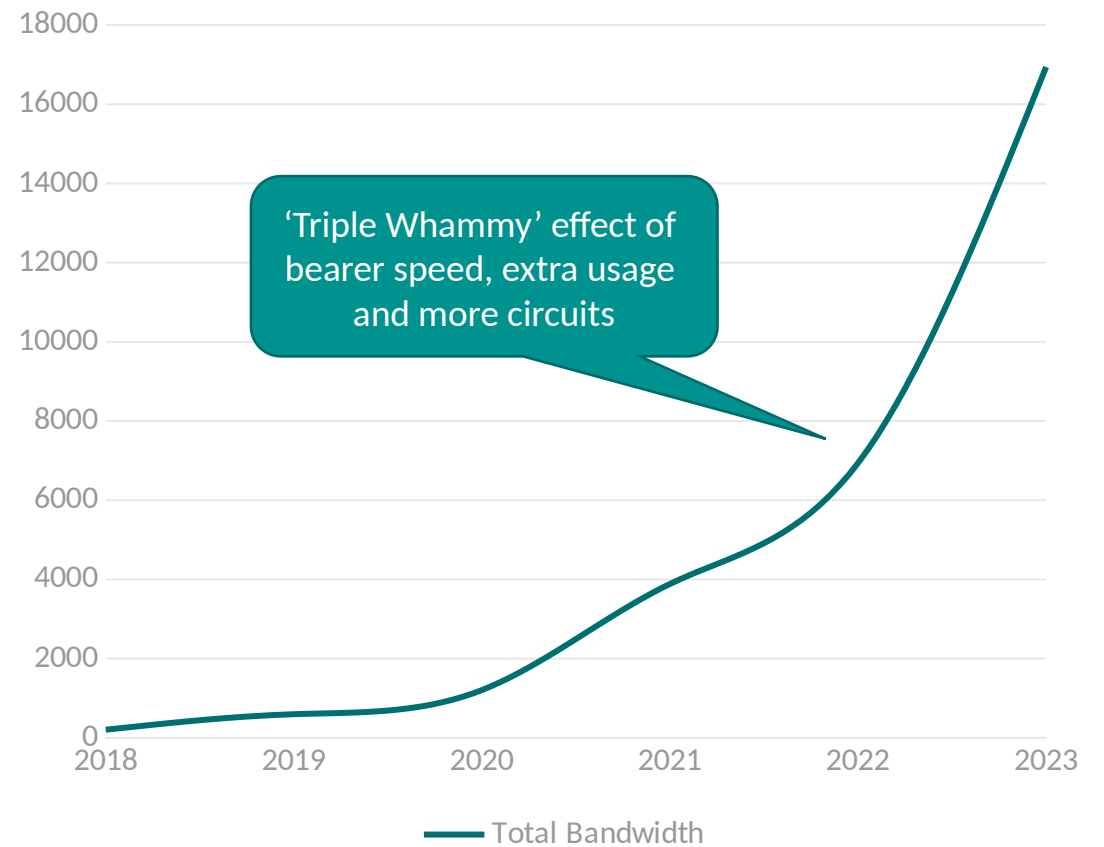


Traffic Growth prediction for Zen

Peak Busy Hour Averages



Total System Bandwidth Gbps





So something has to change...

Forward look of Infrastructure

- More based on future demands and customers
- Significant focus on our partners and wholesale customers' needs rather than just our existing customers
- Need for local off-load of popular content (YouTube/Netflix etc.) meaning flat L2 no longer cuts the grade
- Triple whammy of more customers plus more bandwidth for those customers plus more coverage
- Leads to.....
 - New architecture needed to manage traffic
 - Significant jump in core and aggregation bandwidth
 - Significant jump in edge, transit and BNG capacity

A 2025 capable infrastructure

High level principles

- Carrier Grade Availability
- Industry Alignment (TMForum eTOM/TOGAF & MPLS/E-VPN/E-LAN)
- Interoperability
- High/Total Automation
- Extensible/Scalable design (no 'horizontal scaling' – it doesn't work)
- Secure by Design

Our goals

2021

- 700 exchanges giving 80%+ coverage
- 5Tbps core network
- 2Tbps of Peering and Transit
- 3Tbps of BNG capacity
- 2Tbps of Ethernet capacity
- 10 nx10Gbps metro rings

2025 (maybe...)

- 987 exchanges giving 100% coverage
- 25Tbps core network
- 10Tbps of Peering and Transit
- 15Tbps of BNG capacity
- 10Tbps of Ethernet capacity
- 50 nx100Gbps metro rings



Thank You