

# ***BT IPv6 ISP Trials***



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**BT**exact



# *Outline of Talk*

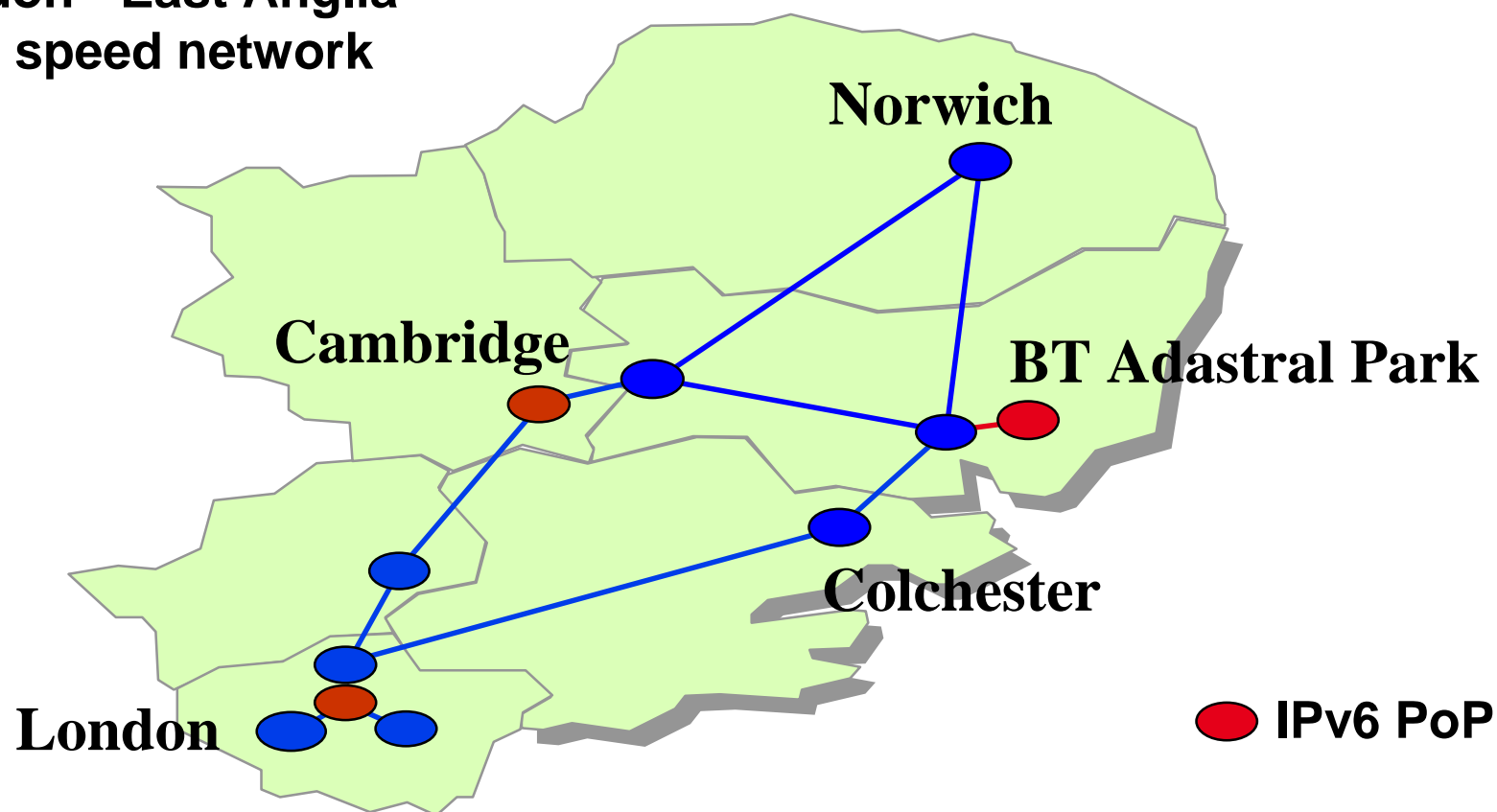
- Purpose of ISP Trial
- Deploying IPv6 Alongside IPv4
- Tunnel Broker Demo
- Lessons Learnt So Far

# *Purpose of IPv6 Trials*

- **Aims: To explore and understand the requirements of becoming an IPv6 ISP**
  - ♦ Evaluate IPv6 technology
  - ♦ Investigate functionality and operational use of network equipment
  - ♦ Inter-working Issues
  - ♦ Establish a pool of IPv6 aware engineers
  - ♦ Provide connectivity for early adopters/researchers
  - ♦ Operational experience of maintaining an IPv6 address register
  - ♦ How do you partition the subTLA?

# Map of LEANet

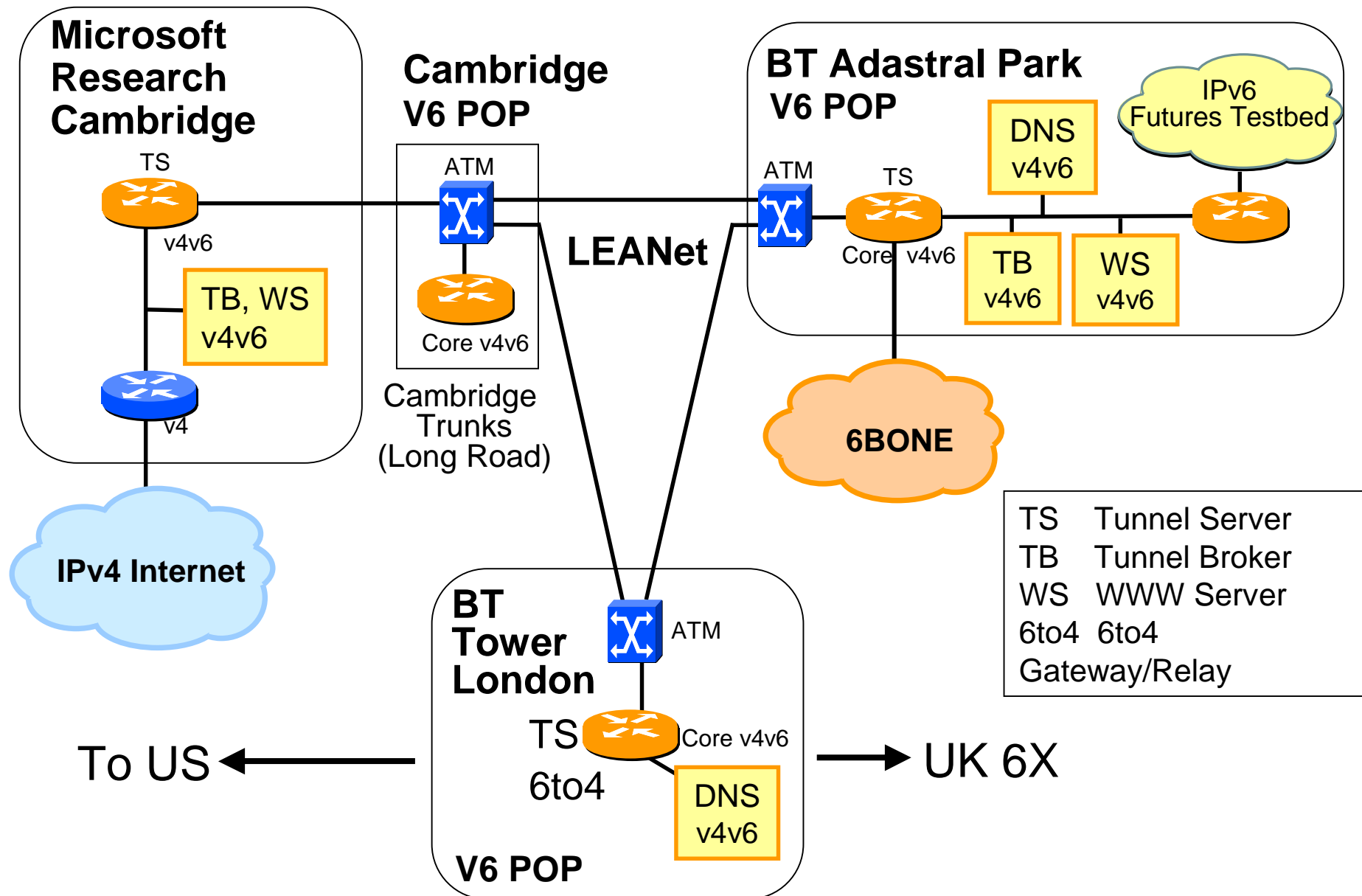
London - East Anglia  
High speed network



Fibre Optic links 8 or 16 wavelengths - Lucent Technologies Wavestar Optical Line 40G DWDM  
SDH 2.5 Gbit/s carrying 16 x 155Mbit/s STM-1 systems - Alcatel 1651SM Add Drop Multiplexors

# IPv6 Trial Network

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# UK Native IPv6 Networks



IPv4 tunnel to  
subTLA's, pTLA  
tunnel broker &  
6to4 relay router

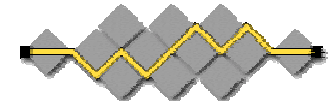


NTT's world  
IPv6 network



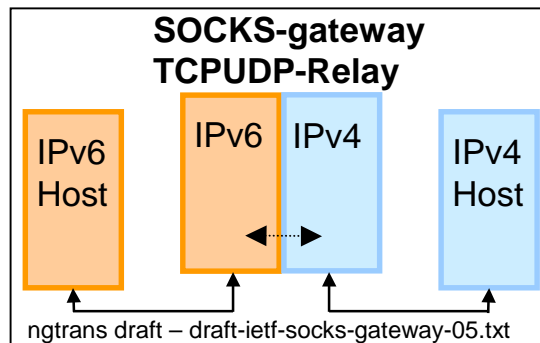
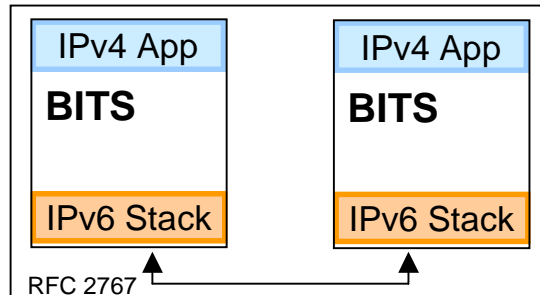
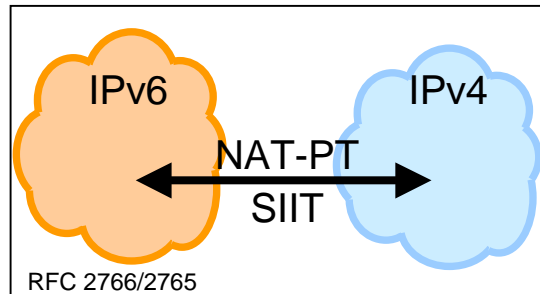
# *Deploying IPv6 alongside IPv4*

- **IPv6 must co-exist with IPv4**
- **Major vendors are starting with dual-stack**
  - ◆ Today - IPv6 optional
  - ◆ Future – IPv6 standard
- **Not all networks will transition the same way**
- **Different mechanisms for different networks**
- **Early methods are:**
  - ◆ 6to4, Tunnel Brokers & NAT-PT

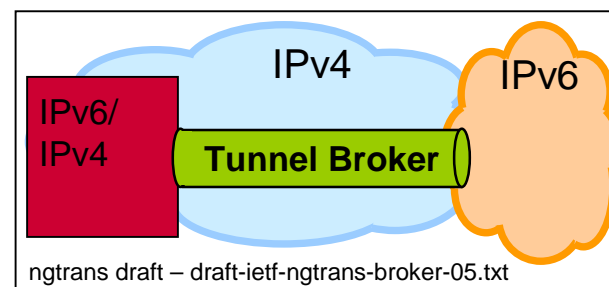
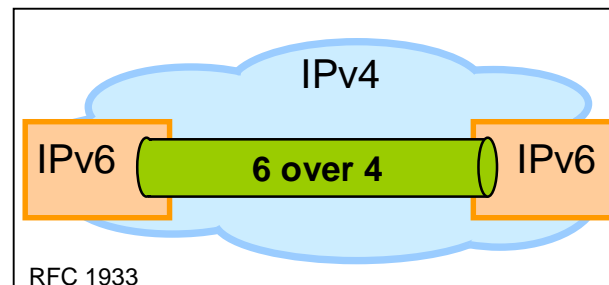
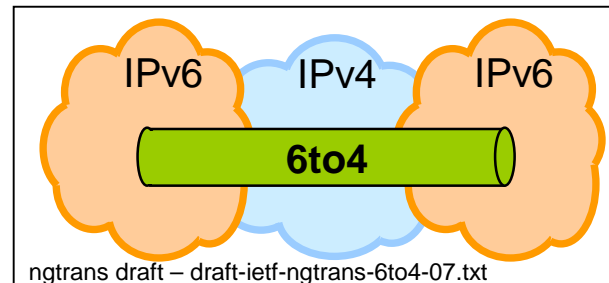


# IETF IPv6 Transition Mechanisms

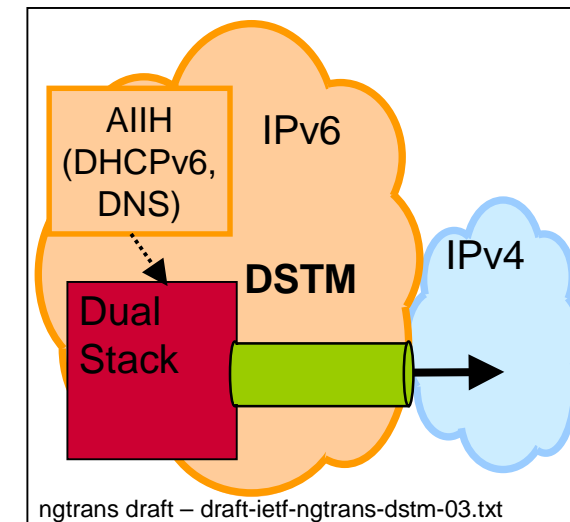
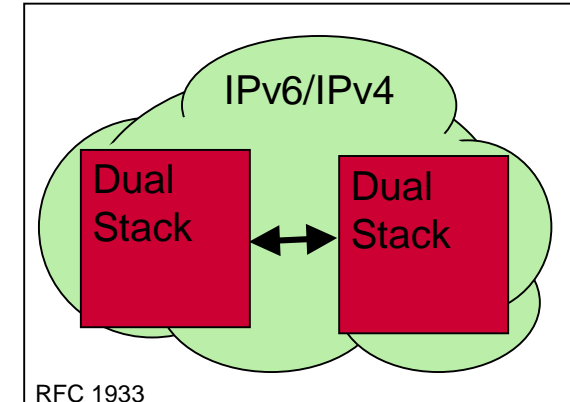
## Translators



## Tunnelling

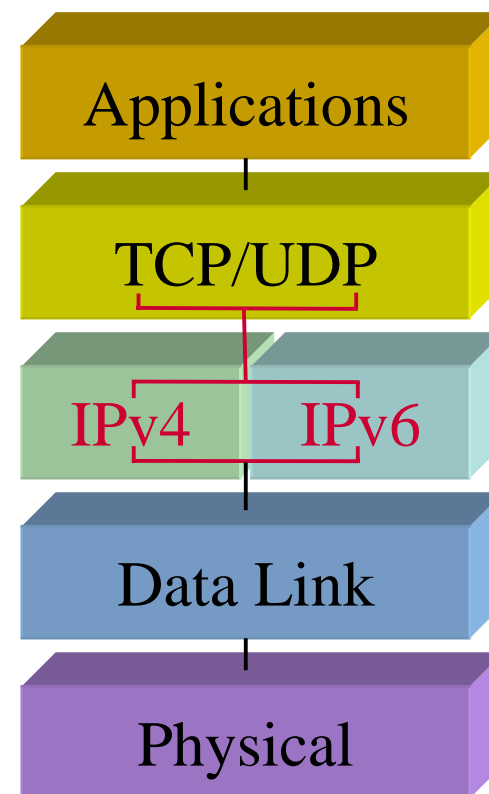


## Dual Stack



# Dual Stack

- Commercial host and router implementations are dual stack rather than IPv6 only
- Dual Stack Transition Mechanism
  - ♦ includes formalised method of assigning temporary global IPv4 addresses to dual stacked hosts using both DHCPv6 and DNS
  - ♦ good for intranets as provides step-by-step migration



Vendors check: SUN, Microsoft, Cisco, Linux & BSD variants

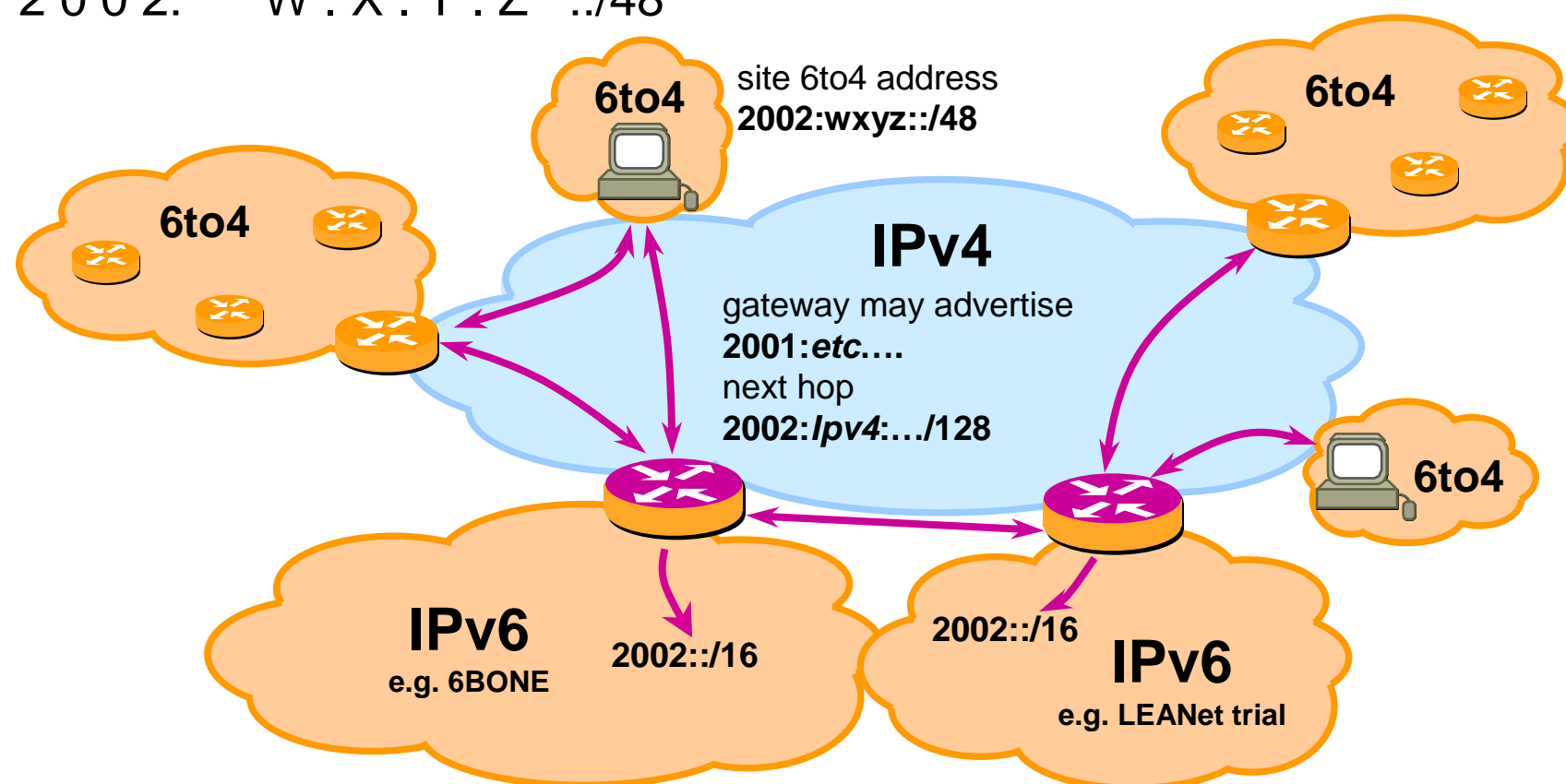
# 6to4

Transition mechanism for isolated IPv6 or dual stack domains

Effectively uses IPv4 network as link layer

IPv6 packets are encapsulated in IPv4 using protocol 41 uses TLA (2002::/16)

TLA	IPv4 Address	SLA	Interface
2002:	W.X.Y.Z	::/48	

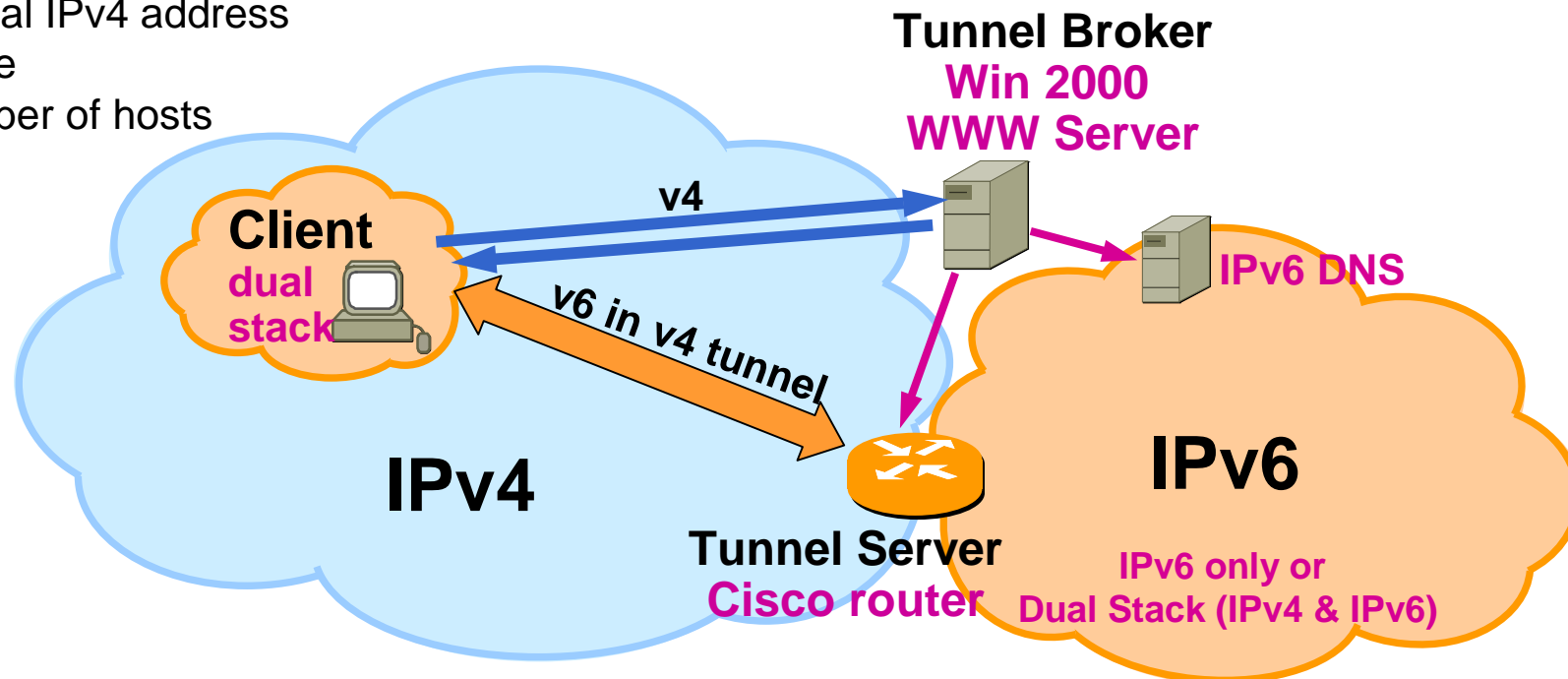


# Microsoft Tunnel Broker Collaboration

BTexact

## Client > Tunnel Broker

- Global IPv4 address
- name
- number of hosts



## Tunnel Broker

- Allocates IPv6 address space to client
- Chooses the nearest Tunnel Server
- Configures the Server Tunnel end point
- Downloads scripts to Client to configure Client Tunnel endpoint
- Registers Client name in IPv6 network DNS (awaiting developments in IETF)

# *Tunnel Broker Demo*

- Visit [www.bt.com/ipv6](http://www.bt.com/ipv6)
- Select BT Trials
- Select BT's IPv6 ISP Trials
- Follow Instructions

