

IPv6 Tutorial

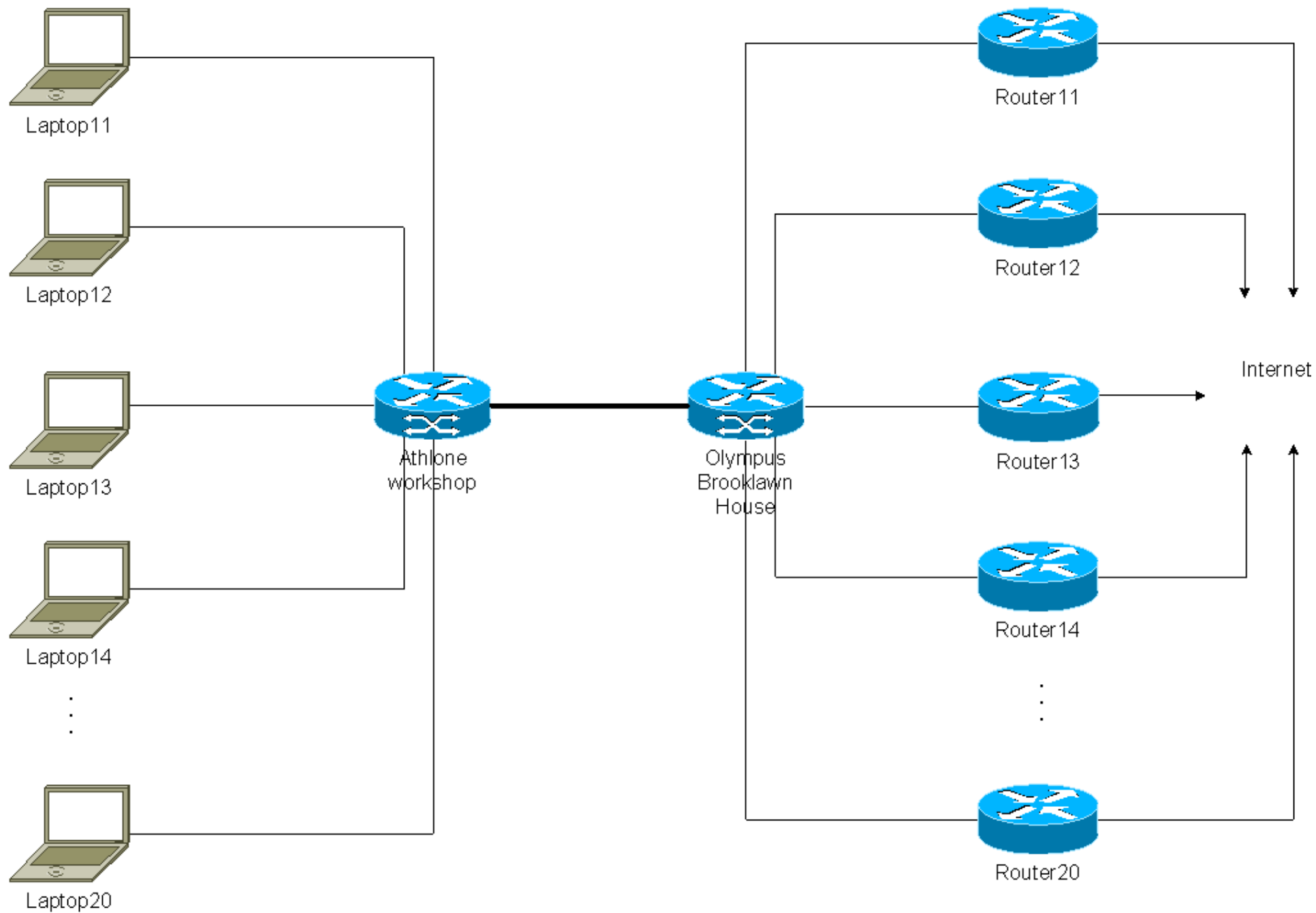
HEAnet Networking Conference
Athlone 2005

Who

- Tutors:
 - David Wilson (HEAnet)
 - Niall Murphy (Amazon)
- Thanks:
 - Mike Peardon (for TCD HPC laptops)
 - David Malone (unavoidably giving another talk)
 - Dave Wilson, Brian Nisbet & team

How

- Assume you know a reasonable amount about IPv4
- Some of you know a reasonable amount about IPv6 already!
- Theory and practice in parallel
- Please interrupt (within reason)
- Dave Wilson talks about Test Lab setup



What

- Enable IPv6 on client laptop
- Examine client address list
 - Talk about scope IDs
 - `ipv6 nc`
- Neighbours & link-local
 - `ping6 ff02::1%scope_id`

What

- Router manipulation
 - Telnet to it
 - sh ipv6 int
 - Router connectivity
 - Configure global address, mtu on eth int
 - Router advertisements
 - enable
- Check new addresses on client

What

- Connect to IPv6 Internet!!
 - Dancing turtle
 - HEAnet facilities
 - IPv4->IPv6 web pages on the fly
- Investigate how much IPv4 we have

Format of IPv6 addresses

- 2001:770:18:2::90/64
 - equivalent to
- 2001:0770:0018:0002:0000:0000:0000:0090/64
 - :: = insert 0's until you can't
 - /64 is prefix length (hard-coded)
 - elide 0's at start (like decimal)
- 2001:0770:00a8:0001:0211:24ff:fe99:e50b

Reading Addresses

- fe80::
 - link-local
- ff00::
 - multicast
- ff02::1
 - all-nodes link-local
- 2000::/3
 - globally routable unicast addresses

Scope IDs

- New address ranges with new meanings in IPv6
 - Need a way to say ‘all hosts’ but limited to an interface
 - Identify an interface to properly scope an address semantic
 - Example: %sis0
 - Is there a way to say ‘all hosts, all interfaces’?

Router Advertisements

- Routers much more important for network management in IPv6 than IPv4
- RAs, per-interface, announce:
 - network prefixes for clients to use
 - “other stuff”