

Lab 01 - Ryan McClue (z5346008)

Homework/Tutorial questions for exams

1. Nslookup

1. The domain **www.koala.com.au** has 2 IP addresses: 104.21.45.210 and 172.67.219.46 In my opinion, the reason for having several IP addresses as an output is for load balancing reasons. Specifically, there are several webserver for the domain to allow traffic be distributed across multiple resources.
2. The IP address 127.0.0.1 is also known as localhost or the loopback device. It's purpose is to provide an interface that allows a host to interact with its own network services Applies to all addresses with CIDR 127.0.0.1 /8

2. Ping

On my own machine not connected to the CSE network:

- **www.unsw.edu.au:** reachable.
- **www.getfittest.com.au:** unreachable; unreachable via web browser as domain has no registered DNS records
- **www.mit.edu:** reachable
- **www.intel.com.au:** reachable
- **www.tpg.com.au:** reachable
- **www.hola.hp:** unreachable; unreachable via web browser as not domain not registered under .hp name server, rather .com, i.e. **www.holahp.com** is accessible
- **www.amazon.com:** reachable
- **www.tsinghua.edu.cn:** reachable
- **www.kremlin.ru:** unreachable; reachable via web browser as server is configured to reject ping ICMP packets but to serve web pages
- **8.8.8.8:** reachable; not reachable via web browser as IP represents Google's Public DNS server and is therefore not configured to serve web pages.

3. Traceroute

1. There are (24 - 1) routers between my workstation and **www.columbia.edu**. (different end result due to many end router destination server possibilities) There are (5) routers along the path that are part of the UNSW network. Between routers (8) and (9) do packets cross the Pacific Ocean. (observe RTT; geolocation data from IP can be deliberately forged for security reasons)

2. The router at which the paths from my machine to the 3 destinations diverge is `138.44.5.0`

CIDR: 138.44.0.0/16 Organization: Asia Pacific Network Information Centre (APNIC)

Comment: This IP address range is not registered in the ARIN database. Comment: This range was transferred to the APNIC Whois Database as part of the ERX (Early Registration Transfer) project.

OrgName: Asia Pacific Network Information Centre OrgId: APNIC Address: PO Box 3646 City: South Brisbane StateProv: QLD PostalCode: 4101 Country: AU

multiple records? this one from APNIC as oppose to US ARIN? net-name: AARNET descr: Australian Academic and Research Network descr: Building 9 descr: Banks Street country: AU

hops not proportional to distance. short and long hops interleave each other based on router locations

reverse path not the same. different routing tables, network conditions different routers have different interfaces so have different IP (2nd one) to respond

diverge from means last common router? how do geolocation tools like yougetsignal work? interesting get 'direct IP not allowed' when using last IP given by traceroute for domain

IMPORTANT: routers can have multiple ip addresses, i.e. multiple interfaces (as oppose to other devices which will have single) this is because routers route between different networks, therefore requiring different IP addresses to interface between them

IMPORTANT: delay not constant. depends on network congestion (e.g. night vs day) varies over time

processing delay: inspecting header to determine where packet needs to go. (fixed number based on header size, e.g UDP less bytes than TCP) queuing: depends on number of packets

if traceroute *'out, what does this mean? just use last IP for determining location?'* and further traffic indicates it did pass router if *'tail at end, routers sensitive to information leaking and cannot say where it ends how does it give a'* and then continue onwards?

car keys use Zigbee. holding to head increases signal strength

3. Run from my own machine not connected to CSE network

`www.speedtest.com.sg` (202.150.221.170) IMPORTANT: Just do traceroute from one web tool

determine public ip with: `dig +short myip.opendns.com @resolver1.opendns.com`

4. Network Performance

brisbane: 756km manilla: berlin:
RTT and associated nodal delay