Network Commands

Communications Systems

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Task 1:

	Machine A	Machine B	UNIX
IPv4 Address	193.60.73.100	193.60.73.113	193.60.76.235
Subnet Mask	255.255.255.0	255.255.255.0	255.255.255.0
Default Gateway	193.60.73.1	193.60.73.1	-
Machine's IP Class	Class C	Class C	Class C
Machine's Network Address	193.60.73.0	193.60.73.0	193.60.76.0
Machine's Host Address	0.0.0.100	0.0.0.113	0.0.0.235

Task 2: Medium Access **Control (MAC) Addresses**

	Machine A	Machine B
Host Name	KW116-069	KW116-060
Physical Address	00-1C-C0-C2-AC-96	00-1C-C0-C2-AC-BF
NIC Manufacturer	Intel Corporate	Intel Corporate
IPv4 Address	193.60.73.100	193.60.73.113
Subnet Mask	255.255.255.0	255.255.255.0
Lease Obtained	13 November 2012 10.58:09	13 November 2012 11:02:52
Lease Expires	20 December 2148 10.15:03	20 December 2148 18:01:54
Default Gateway Address	193.60.73.1	193.60.73.1
DHCP Server Address	193.60.48.8	193.60.48.8
DNS Servers Addresses	193.60.73.244	193.60.73.244
Primary WINS Server Address	193.60.52.230	193.60.52.230

	Machine A			Machine B		
	Network Class	Network Address	Host Address	Network Class	Network Address	Host Address
IPv4 Address	C	193.60.73.0	0.0.0.100	C	193.60.73.0	0.0.0.113
Default Gateway Address	C	193.60.73.0	0.0.0.1	C	193.60.73.0	0.0.0.1
DHCP Server Address	C	193.60.48.0	0.0.0.8	C	193.60.48.0	0.0.0.8
DNS Servers Addresses	C	193.60.73.0	0.0.0.244	C	193.60.73.0	0.0.0.244
Primary WINS Server Address	C	193.60.52.0	0.0.0.230	C	193.60.52.0	0.0.0.230

UNIX Command		Addresses
netstat -rn	Default Gateway Address	193.60.73.1
cat /etc/resolv.conf	DNS Servers Addresses	193.60.49.84

Task 3: Computer 1 and Computer 2 are located on the same network and are able to communicate easily; Computer 3 will not be able to communicate as it is on a different network. 1 or 2 wouldn't communicate back to 3. But 3 can communicate to 1 ad 2.

	Computer 1	Computer 2	Computer 3
IP Address	192.168.12.113	192.168.12.205	192.168.112.97
Subnet Mask	255.255.255.0	255.255.255.0	255.255.255.0
Default Gateway	192.168.12.1	192.168.12.1	192.168.12.1

Task 4: Pinging

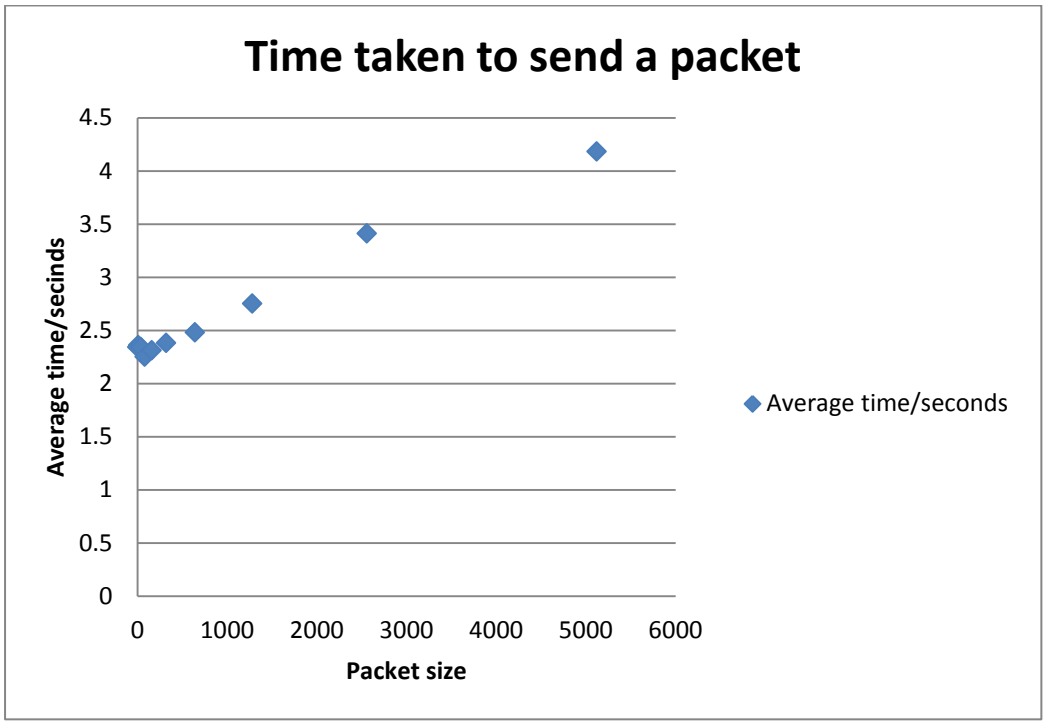
	193.60.73.100/KW116-069	193.60.76.235/ Student	Ping from Windows Successful?	Ping from UNIX Successful?
ping the IP address of a Windows computer	193.60.73.113	193.60.73.113	Yes	Yes
ping the IP address of a UNIX machine	193.60.76.235	193.60.76.235	Yes	Yes
ping the IP address of the default gateway	193.60.73.1	193.60.76.1	Yes	Yes
ping the IP addresses of a DNS server	193.60.73.244	193.60.49.84	Yes	Yes
ping the Loopback IP address (If the ping is successful, then TCP/IP is properly installed and functioning on the computer.)	127.0.0.1	127.0.0.1	Yes	Yes
ping the hostname of another computer (the UNIX hostname can be found with the hostname command)	student	KW116-069	Yes	Yes
ping www.cisco.com	2.12.144.170	2.12.144.170	Yes	Yes

ping www.microsoft.com Notice that the DNS server was able to resolve the name to an IP address, but there is no response. Some Microsoft routers are configured to ignore ping requests. This is a frequently implemented security measure	65.55.57.27	65.55.57.27	Request timed out. No answer	No answer from www.microsoft.com

Packet size	Average Time /seconds
10	2.36
20	2.34
40	2.34
80	2.25
160	2.31
320	2.38
640	2.48
1280	2.75
2560	3.41
5120	4.18

The table and graph below show the results of our attempt to ping www.cisco.com. The number of pings used was 5 and the packet size increased twice very time. The results form a trend in which we can see that as the packet size was getting larger the time taken for the ping to send was also gradually increasing.

The highest packet size we were able to send was 5120 as the doubled packet size which was 10240 was not able to display the transmission rate.



Task 5: Trace route

Environment	Command	Average Delay
Windows	ping -n 5 -l 128 www.cisco.com	2ms
UNIX	ping -s www.cisco.com 128 5	2.25ms

Domain Name	IP addresses	Host Name	Network Address	Number of Hops - Windows	Number of Hops - UNIX
www.cms.gre.ac.uk	193.60.77.235	www.cms.gre.ac.uk	193.60.77.0	2	2
staffweb.cms.gre.ac.uk	193.60.76.168	camus.cms.gre.ac.uk	193.60.76.0	2	2
www.gre.ac.uk	193.60.68.103	ah-ils-web-squid1.gre.ac.uk	193.60.68.103	4	4

Domain Name	IP addresses	Host Name	Network Address	Number of Hops - Windows	Number of Hops - UNIX
www.google.co.uk	173.194.66.94	www.google.co.uk	173.194.0.0	13	13
http://www.australia.com	92.122.126.218	a1441.b.akamai.net	92.0.0.0	8	8
http://www.dfo.gov.ru/	95.173.153.198	www.dfo.gov.ru	95.0.0.0	15	30

Task 6: Netstat with appropriate parameters.

Task	Windows Command	UNIX Command	Windows	UNIX
Show all active connections	netstat	netstat -a	-	-
Show all active TCP connections in numerical form	netstat -ap tcp	netstat –aP tcp	-	-
Show all active TCP connections with Fully Qualified Domain Names for foreign addresses	Netstat -afp tcp	netstat -aP tcp -v	-	-
What are the number of IP packets received and sent since boot-up? How many were in error?	netstat -e	netstat -as	Received: 658873893 Sent: 51043012 Errors: 0	Received : 1750538944 sent : 1711692247 Errors: 0
What are the numbers of IP packets sent and received in a typical 10 second interval?	netstat –e t10	netstat -s10	Received : 611121 Sent: 102040	Received 24114 Sent: 24024
What are the numbers of TCP segments transmitted and received in a typical 20 second interval? How many retransmissions were there?	netstat -s 20	netstat -s 20	Segments Received: 339794 Segments Sent: 111803 Segments Retransmitted: 1869	Received: 19905 Sent: 72948 Retransmitted: 120
UDP datagrams - what are the numbers transmitted and received in a typical 20 second interval?	netstat -s 20	netstat -s 20	Datagrams Received = 64340 Datagrams Sent = 16953	Received: 198 Sent :200
How many ICMP messages were sent and received in a typical 20 second interval?	netstat -s 20	netstat -s 20	Received:1435 Sent:1135	Received = 1 Sent = 1
List the routing table entries	netstat -r	netstat -r	See appendix for routing table	See appendix for routing table

Appendix

Windows routing table (netstat –r)

```
C:\Users\km283>netstat -R
===========================================================================
Interface List
 17...00 25 4b 9b 04 2b ......Microsoft Virtual WiFi Miniport Adapter
 14...00 25 4b f8 41 88 ......Bluetooth Device (Personal Area Network)
 12...00 25 4b 9b 04 2b ......Broadcom 802.11n Network Adapter
 11...00 26 08 0e 8a be ......NVIDIA nForce 10/100/1000 Mbps Ethernet
 15...00 50 56 c0 00 01 ......VMware Virtual Ethernet Adapter for VMnet1
 16...00 50 56 c0 00 08 ......VMware Virtual Ethernet Adapter for VMnet8
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0    193.60.73.1    193.60.73.245     10
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    306
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    306
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    306
    192.168.98.0    255.255.255.0         On-link      192.168.98.1    276
    192.168.98.1  255.255.255.255         On-link      192.168.98.1    276
  192.168.98.255  255.255.255.255         On-link      192.168.98.1    276
   192.168.174.0    255.255.255.0         On-link     192.168.174.1    276
   192.168.174.1  255.255.255.255         On-link     192.168.174.1    276
 192.168.174.255  255.255.255.255         On-link     192.168.174.1    276
     193.60.73.0    255.255.255.0         On-link     193.60.73.245    266
   193.60.73.245  255.255.255.255         On-link     193.60.73.245    266
   193.60.73.255  255.255.255.255         On-link     193.60.73.245    266
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    306
        224.0.0.0        240.0.0.0         On-link     193.60.73.245    266
        224.0.0.0        240.0.0.0         On-link     192.168.174.1    276
        224.0.0.0        240.0.0.0         On-link      192.168.98.1    276
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    306
  255.255.255.255  255.255.255.255         On-link     193.60.73.245    266
  255.255.255.255  255.255.255.255         On-link     192.168.174.1    276
  255.255.255.255  255.255.255.255         On-link      192.168.98.1    276
===========================================================================
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    306 ::1/128                  On-link
  1    306 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None

C:\Users\km283>_
```

UNIX routing table (netstat –r)