

# Network Commands - Marking Scheme

	Registration Number	Surname	Forename	% Contribution (Out of 100)
Student 1	000839875	Turon	Kacper	25%
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<b>Task</b>	<b>Mark</b>	<b>Mark</b>
Task 1 - ipconfig / ifconfig -a	15%	
Task 2 - ipconfig /all	15%	
Task 3 - Address Problem	15%	
Task 4 - Ping and Graph	20%	
Task 5 - tracert / traceroute -I	15%	
Task 6 - Netstat	20%	
Total	100 %	

# COMP1587 Communication Systems

## Laboratory 6

### Network Commands

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## Results

### Task 1 - ipconfig / ifconfig -a

	Machine A	Machine B	UNIX
IPv4 Address	193.60.73.204	193.60.73.114	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	193.60.73.255	193.60.73.255	193.60.76.255

Table 1

### Task 2 - ipconfig /all

	Machine A	Machine B
Host Name	KW116-032	KW115-031
Physical Address	78-24-AF-89-B2-94	78-24-AF-89-B3-37
NIC Manufacturer	78-24-AF	78-24-AF
IPv4 Address	193.60.73.204	193.60.73.114
Subnet Mask	255.255.255.0	255.255.255.0
Lease Obtained	17 November 2015 09:23:43	17 November 2015 12:59:42
Lease Expires	24 December 2151 19:54:32	24 December 2151 19:50:15
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; 193.60.77.254	193.60.73.244; 193.60.77.254
Primary WINS Server Address	193.60.52.230	193.60.52.230

Table 2

	Machine A			Machine B		
	Network Class	Network Address	Host Address	Network Class	Network Address	Host Address
IPv4 Address	C	193.60.73.0	193.60.73.255	C	193.60.73.0	193.60.73.255
Default Gateway Address	C	193.60.73.0	193.60.73.255	C	193.60.73.0	193.60.73.255
DHCP Server Address	C	193.60.48.0	193.60.48.255	C	193.60.48.0	193.60.48.255
DNS Servers Addresses	C	193.60.73.0; 193.60.77.0;	193.60.73.255; 193.60.77.255	C	193.60.73.0; 193.60.77.0;	193.60.73.255; 193.60.77.255
Primary WINS Server Address	C	193.60.52.0	193.60.52.255	C	193.60.52.0	193.60.52.255

Table 3

UNIX COMMAND		Address(es)
<b>netstat -rn</b>	Default Gateway Address	193.60.76.1
<b>cat /etc/resolv.conf</b>	DNS Servers Addresses	193.60.49.84 193.60.48.13 193.60.48.9

Table 4

### Task 3 - Address Problem

	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

Table 5

All three of these computers use the same gateway: 192.168.12.1, so they access the same network using shared IP address. They also share the same subnet mask, 255.255.255.0. If permissions are set properly, they should be able to communicate to each other except from computer number 3, which is on different subnet 192.168.112.x instead of 192.168.12.x.

### Task 4 - Ping and Graph

	Ping from Windows Successful?	Ping from UNIX Successful?
ping the IP address of a Windows computer (IP: 193.50.73.114)	Yes	No
ping the IP address of a UNIX machine (IP: 193.60.76.235)	Yes	Yes
ping the IP address of the default gateway (IP: 193.60.73.1)	Yes	Yes
ping the IP addresses of a DNS server (IP: 193.60.73.244 ; 193.60.77.254)	Yes	Yes
ping the Loopback IP address (IP: 127.0.0.1)	Yes	Yes
ping the hostname of another computer (hostname: KW116-032)	Yes	Yes
ping www.cisco.com	Yes	Yes
ping www.microsoft.com	Yes	Yes

Table 6

	Command	Average Delay
Windows	Ping -n 5 -l 128 www.cisco.com	2 ms
UNIX	Ping -s <a href="http://www.cisco.com">www.cisco.com</a> 128 5	4.71 ms

Table 7

Packet Size	Average Time (s)
250	3.556
500	3.672
1000	3.851
2000	4.27
4000	4.937
8000	6.145
16000	8.698

Table 8

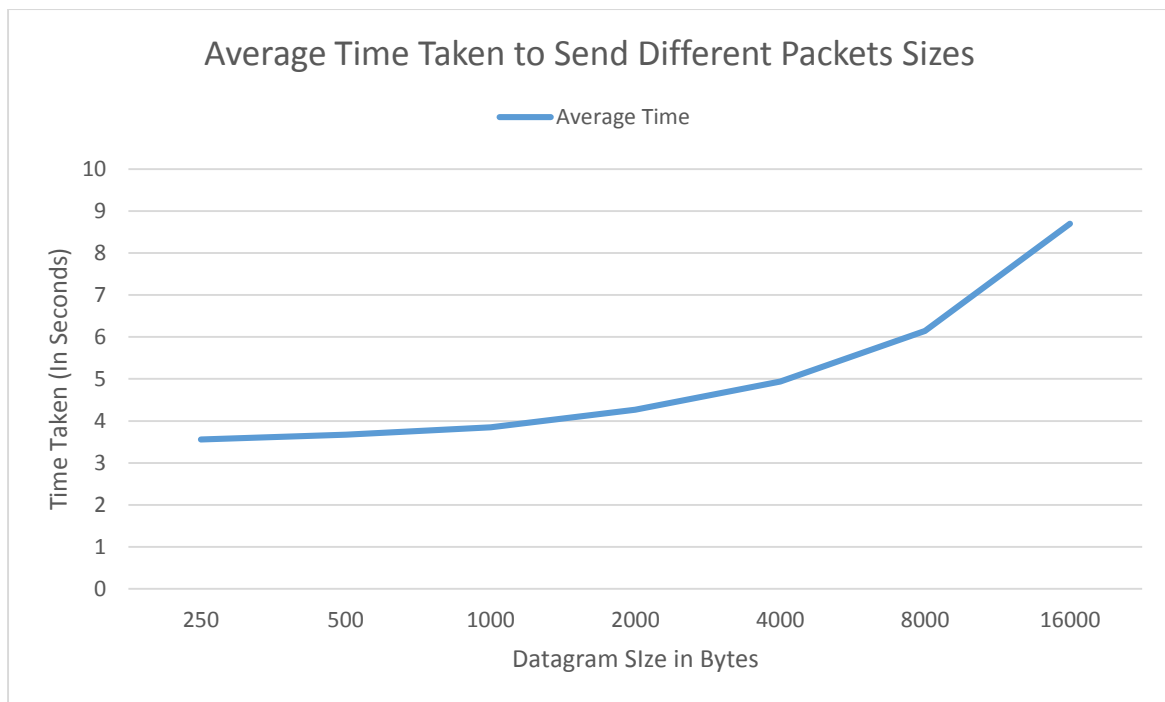


Figure 1

This shows that every time the packet size is increased, it takes longer to complete. The average number of pings we used were 10. We used [www.cisco.com](http://www.cisco.com) throughout each byte and we took the average from the result we received.

#### Task 5 - tracert / traceroute –I

Domain Name	IP addresses	Host Name	Network Address	Number of Hops - Windows	Number of Hops - UNIX
www.cms.gre.ac.uk	193.60.72.1; 193.60.77.23 5	cms-webserver.c ms.gre.ac.uk	193.60.72.0; 193.60.77.0	2	2
staffweb.cms.gre.ac.uk	193.60.72.1; 193.60.76.16 8	staffweb.cms. gre.ac.uk	193.60.72.0; 193.60.76.0;	2	1
www.gre.ac.uk	193.60.72.1; 193.60.78.10 1	gmwebsitevip .gre.ac.uk	193.60.72.0; 193.60.78.0	2	2

Table 9

Domain Name	IP addresses	Host Name	Network Address	Number of Hops - Windows	Number of Hops - UNIX
<a href="http://www.amazon.com">www.amazon.com</a>	54.239.17.6; 54.239.26.128	www.amaz on.com	54.239.17.0; 54.239.26.0	30	30
www.google.com.au	173.194.67.94; 173.194.45.63	www.googl e.com.au	173.194.67.0; 173.194.45.0	13	13
www.gov.hk	68.232.34.73; 68.232.34.73	dual46.gs1. wcp.v2cdn. net	68.232.34.0; 68.232.34.0	10	10

Table 10

## Task 6 - Netstat

Table 11

Task	Windows Command	UNIX Command	Windows	UNIX
Show all active connections	netstat -a	netstat -a	-	-
Show all active TCP connections in numerical form	netstat -p tcp -n	netstat -f inet -n	-	-
Show all active TCP connections with Fully Qualified Domain Names for foreign addresses	netstat -p tcp -f	netstat -n	-	-
What are the number of IP packets received and sent since boot-up? How many were in error?	netstat -s -p ip	netstat -f inet -P ip -s	Packets Received: 6153511  Packet Sent: 4599557 Errors: 0	Received: 3454099453  Packet sent: =3189353102 Errors: 0
What are the numbers of IP packets sent and received in a typical 10 second interval?	netstat -s -p ip 10  CTRL + C on second display to stop	netstat -f inet -P ip -s 10  CTRL + C on second display to stop	Packets Received: 6256709 Packet Sent: 4600236 Errors: 0	Received: 1420 Sent: 1320
What are the numbers of TCP segments transmitted and received in a typical 20 second interval? How many retransmissions were there?	netstat -s -p tcp 20  CTRL + C on second display to stop	netstat -f inet -P tcp -s 20  CTRL + C on second display to stop  tcpInSegs and tcpOutSegs showed segments transmitted and received, tcpRetransSegs showed the number of segments retransmitted.	Received: 3570447  Sent: 2437852  Retransmission: 8776	Received: 534 Sent: 335 Retransmitted: 0
UDP datagrams - what are the numbers transmitted and received in a typical 20 second interval?	netstat -s -p UDP 20  CTRL + C on second display to stop	netstat -f inet -P udp -s 20  CTRL + C on second display to stop	Received : 913706 Sent: 425203 Errors : 0	Received: 44 Sent: 54

How many ICMP messages were sent and received in a typical 20 second interval?	netstat -s -p ICMP 20  CTRL + C on second display to stop	netstat -f inet -P icmp -s 20  CTRL + C on second display to stop	Received: 17 Sent: 19  Errors: 0	Received: 3 Sent: 2 Errors: 0
List the routing table entries	netstat -r	netstat -r	Refer to Figure 1.1	Refer to Figure 1.2

## Windows

```
J:\>netstat -r
=====
Interface List
=====
11...00 22 4d 99 94 89 .....Intel(R) 82579LM Gigabit Network Connection
12...00 50 56 c0 00 01 .....VMware Virtual Ethernet Adapter for VMnet1
13...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          193.60.72.1       193.60.72.221    20
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
192.168.142.0              255.255.255.0    On-link           192.168.142.1    276
192.168.142.1              255.255.255.255  On-link           192.168.142.1    276
192.168.142.255            255.255.255.255  On-link           192.168.142.1    276
192.168.254.0              255.255.255.0    On-link           192.168.254.1    276
192.168.254.1              255.255.255.255  On-link           192.168.254.1    276
192.168.254.255            255.255.255.255  On-link           192.168.254.1    276
193.60.72.0                255.255.255.0    On-link           193.60.72.221    276
193.60.72.221              255.255.255.255  On-link           193.60.72.221    276
193.60.72.255              255.255.255.255  On-link           193.60.72.221    276
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           193.60.72.221    276
224.0.0.0                  240.0.0.0        On-link           192.168.142.1    276
224.0.0.0                  240.0.0.0        On-link           192.168.254.1    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           193.60.72.221    276
255.255.255.255            255.255.255.255  On-link           192.168.142.1    276
255.255.255.255            255.255.255.255  On-link           192.168.254.1    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

J:\>
```

Figure 1.1

## UNIX

```
ub2232e@student 110 % netstat -r

Routing Table: IPv4
Destination          Gateway              Flags  Ref    Use  Interface
-----
default              rgm-v4-1.gre.ac.uk  UG          1   4111674  e1000g0
193.60.76.0          student             U          1     96977  e1000g0:1
base-address.mcast.net student             U          1         0  e1000g0:1
localhost            localhost           UH          2     8724  lo0:1
ub2232e@student 111 %
```

Figure 1.2



## References

Greenwich, University of. (2015) *Network Commands*, 1st ed, Greenwich, University of Greenwich, [online] Available at: <http://staffweb.cms.gre.ac.uk/~lg47/lectures/COMP1587/COMP1587Lab6.pdf> (Accessed 18 November 2015).