

Name ID Section Seat No

Sirindhorn International Institute of Technology Thammasat University

Final Exam: Semester 2, 2010

Course Title: ITS332 Information Technology Laboratory II

Instructor: Steven Gordon

Date/Time: Friday 4 March 2011; 13:30–15:00

Instructions:

- This examination paper has 14 pages (including this page).
- Conditions of Examination: Closed book; No dictionary; Non-programmable calculator is allowed
- Students are not allowed to be out of the exam room during examination. Going to the restroom may result in score deduction.
- Students are not allowed to have communication devices (e.g. mobile phone) in their possession.
- Write your name, student ID, section, and seat number clearly on the front page of the exam, and on any separate sheets (if they exist).
- Assume the user in all questions has administrator privileges (that is, you can ignore the need for `sudo`).
- Reference material at the end of the exam may be used.

ITS332 Final Exam Hints

- Exam duration: 90 minutes (13:30 to 15:00)
- 6 questions
- 50 marks total
- Cover topics since midterm: Layer 3 Networks, Firewalls, Client/Server Sockets programming
- Questions include:
 - network design concepts
 - using commands such as ifconfig, route, iptables and others
 - understanding C sockets source code (the source code is given in the exam; you need to answer questions about the source code)
- Reference Material is given at end of exam (see following pages). (The Reference Material is copied from Midterm exam, with extra information added – not all of it is useful for final exam)
- When giving answers containing a command (e.g. ifconfig ...), be careful to give the exact command using correct syntax – consult the Reference Material for the syntax.

Reference Material

Below is the syntax of commonly used commands. The values that the user must choose are given enclosed in < and >. Optional fields are enclosed in [and]. You may use this information in your answers.

```
ifconfig [<interface>] [up | down]
ifconfig <interface> <ipaddress> netmask <subnetmask>
ping [-c <count>] [-s <packetsize>] [-i <interval>] <destination>
tracert <destination>
nslookup <domain> [<dnsserver>]
route [-n]
route add -net <netaddress> netmask <subnet> [gw <gateway>] [dev <interface>]
route del -net <netaddress> netmask <subnet> [gw <gateway>] [dev <interface>]
route add default gw <gateway>
arp [-n]
dhclient [<interface>]
apache2ctl [start | stop | restart]
htpasswd <passwordfile> <username> [-b <password>]
iptables -A <chain> [<options>]
  where <options> include:
    [-s <sourceip>] [-d <destip>] [-i <ininterface>] [-o <outinterface>]
    [-p <protocol>] [--sport <sourceport>] [--dport <destport>]
    [-j <action>]
iptables -D <chain> [<options>]
iptables -L <chain>
iptables -F <chain>
  where <chain> may be: INPUT | OUTPUT | FORWARD
```

Commonly used files and directories are listed below. You may use this information in your answers.

```
/etc/hosts
/etc/resolv.conf
/etc/network/interfaces
/etc/services
/var/lib/dhcp3/dhclient.leases
/proc/sys/net/ipv4/ip_forward
/var/www/
/etc/apache2/sites-available/default
```

Port numbers used by common applications include:

20 FTP data transfer

21 FTP connection control

22 SSH, secure remote login

- 23** TELNET, (unsecure) remote login
- 25** SMTP, email transfer between servers
- 53** DNS, domain name lookups
- 67** DHCP server
- 80** HTTP, web servers
- 110** POP3, client access to email
- 123** NTP, network time
- 443** HTTPS, web servers with secure access
- 520** RIP, routing protocol
- 631** IPP, Internet printing

Protocol numbers for commonly used transport protocols include:

- 1** ICMP
- 2** IGMP
- 6** TCP
- 17** UDP
- 33** DCCP
- 41** IPv6 encapsulation
- 47** GRE
- 89** OSPF