Marking Sheet

Q1.

a) The tick rate specifies how often the kernel will switch busy processes out (**1 mark**)

b) Advantages

- Faster response time (waiting process switched in more quickly) (**1 mark**)
- Timing of events is more accurate as the time can be checked more often (**1 mark**)

Disadvantages

- Lower CPU utilisation – switch time is constant, this increases the switching rate (**1 mark**)
- Higher disk usage – in a system with high memory usage there will be a higher rate of page switching (**1 mark**)

Q2.

a) Launching of child processes (**1 mark**). Management of foreground and background tasks (**1 mark**)

b) The shell will:

- Launch a new child process to run **`grep`** (**1 mark**)
- Launch a new child process to run **`wc`** (**1 mark**)
- Create a pipe, all output to **stdout** by **`grep`** is directly piped into **stdin** for **`wc`** (**1 mark**)

Q3.

A user has run a **traceroute** to map the network between the workstation and www.freebsd.org, the distance between the two hosts is 9 network hops (**1 mark**). The user is connected to the Internet using Internode as their ISP (**1 mark**). The RTT between the user and their ISP first hop router is ~30ms (**1 mark**). The link between hops three and four are the link between Melbourne and Sydney, RTT ~150ms (**1 mark**). The end host is also located in Australia (**1 mark**).

Q4.

Represents the three-way TCP handshake (**1 mark**). The specified fields are:

`15:19:00.337420` – The timestamp when the packet was captured (**1 mark**)

`136.186.228.20.36919 > 136.186.229.16.80` – Source and destination IP Address/Port Number for the TCP packet, This is a TCP packet from 136.187.228.20, port 36919 to 136.186.229.16, port 80 (**1 mark**)

`S` – This is a TCP SYN packet (**1 mark**)

`535825765:535825765(0)` – The TCP sequence number of the first and last byte (**1 mark**) in the packet. In this case there is no data in the packet (both numbers are equal) (**1 mark**)

`ack 535825766` – This is a TCP ACK packet (**1 mark**) acknowledging the specified sequence number (**1 mark**)

`win 65535` – This host (source) is specifying its receiver Window Size, the sender should not exceed this Window Size (**2 marks**)

Q5.

a) NO (**1 mark**), the kernel already supports routing as it is part of the IP protocol (**1 mark**)

b) NO (**1 mark**), typically servers with multiple NICs would be considered multi-homed rather than supporting routing functionality (**1 mark**). Servers/computers should not route traffic between networks as this could circumvent network design (**1 mark**). Since this is the "normal" implementation, routing is disabled by default (**1 mark**)

c) Self provided router

- Create a gateway between internal and external network (**1 mark**)
- Can protect server by only enabling internal services on internal network/NIC (**1 mark**)
- Can implement a Unix based firewall, more generic and configurable than firewalls within hard-routers (**1 mark**)
- Can implement queueing/bandwidth limitation rules to improve/handicap certain network applications (**1 mark**)

Q6.

a) Warrop has specified the address range incorrectly (**1 mark**), the end of the range falls outside the range specified by the network address (**1 mark**)

b) Default lease time is 15 days (1296000 seconds) (**2 mark**).

c) `default-lease-time` is the duration of the lease provided to a host if a generic lease is requested (**2 marks**). A host can request a lease and specify a duration (**1 mark**). As long as the requested lease duration is shorter than the `max-lease-time` then a lease for the requested duration is granted (**1 mark**). No lease longer than max-lease-time may be granted (**2 marks**)

Q7.

a) `forwarders` specifies that any requests that cannot be serviced directly by this DNS server will be forwarded to the specified DNS servers (100.101.102.103 and 100.101.102.106) (**2 marks**)

b) `pid-file` defines the filename where the process ID of the bind process will be stored (**1 mark**) This allows scripts to contact the bind process to stop/restart it (**1 mark**).

c) The `allow-query` statement defines that this server will only respond to DNS requests originated by hosts in the 192.168.0.* and 192.168.1.* networks (**2 marks**) and any queries originating from **localhost** (**1 mark**)

d) NO, while the server will respond to queries from **localhost** (**1 mark**), it will not accept any connections on the **localhost** interface due to the `listen-on` statement (**2 marks**).

Q8.

a) **public** (**1 marks**)

b) Allowed users – jbut and het306 (**1 mark**). Allowed to connect from – 192.168.0.*, 192.168.10.* and localhost (**1 mark**). Users have read/write access (**1 mark**)

c) The `force create mode` statement specifies that all files created on this share will have their Unix permission bits forced to 777 (**1 mark**). This will cause all files to be read/write/executable by all users (**1 mark**)

d)

- Create an empty directory to mount the share onto (**1 mark**)
- Run mount to mount the samba share onto the newly created specified directory (**1 mark**)
- You will be asked for user name/password authentication which must be provided (**1 mark**)
- You can access the share by changing into the newly mounted directory (**1 mark**).

Q9.

a) **wwwhost.net** (**1 marks**)

b) Two customers, the base site is owned and operated by the service provider (**1 marks**)

c) Each user has an account on the system and should be provided with a username/password combination such that they can logon and transfer files to their account (**1 mark**). Users should create their web site as a set of pages/files (**1 mark**). Generated web site should be uploaded to the `public_html` sub-directory in their home directory (**1 mark**). The base page should be saved as `index.html` (**1 mark**)

d) Customer is `unixforall` (**1 mark**). One of the log files for this customer will be written to `acme`'s home directory rather than that for `unixforall` (**1 mark**)

e) Customer needs to configure the DNS system such that a DNS resolution for their web site will resolve to the IP address of the web server provided by the web hosting company (**2 marks**)