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SAMPLE WRITTEN PAPER 2010

CS2510 Web Servers

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Answer **three** of the four questions.
Silent non-programmable calculators may be used.

Time allowed: 90 minutes

1. (*10 marks*)

   i) (*4 marks*) Give the main advantages and disadvantages of choosing a process-only server over a threads-only server.

   ii) (*6 marks*) Choose one of the following technologies, and then write a memo to a Web site administrator comparing in depth your chosen technology to CGI as a way of providing the site with dynamic content:
      - server-side includes; or
      - using a Tomcat server instead of an Apache server and using it to run Java servlets.

2. (*10 marks*) Assume that the Google spider is well-behaved and has user agent name Googlebot and IP address 66.249.66.129. Assume that the ExtractorPro email address harvester is not well-behaved and has user agent name ExtractorPro and IP address 38.113.244.231.

   An Apache Web server uses `mod_authz_host` for access control and has `/htdocs` as its document root.

   The site administrator wants to block all clients from all directories other than the document root. She wants to allow all clients, except ExtractorPro, to access the document root, and she wants to allow them to use `GET` requests only. She wants to block Googlebot entirely from the `/htdocs/private` directory.

   i) (*4 marks*) The site administrator puts the following into `/htdocs/robots.txt`:
   ```
   User-Agent: Googlebot
   Disallow: /htdocs/private/

   User-Agent: ExtractorPro
   Disallow: /
   ```
   Explain in detail how effective she will be in achieving her goals.

   ii) (*6 marks*) The site administrator decides instead to use access control.

   Show what she should add to her server's `httpd.conf` file. Use some or all of the `Order`, `Allow`, `Deny`, `Directory`, and `Limit` or `LimitExcept` directives.

3. (*10 marks*) Explain in detail how each of the following directives may affect the security of an Apache Web server:

i) `AllowOverrides All`

ii) `ServerTokens Full`

iii) `Options -Indexes`

iv) `ErrorDocument 404 /errors/not_found.html`

v) `SuExecUserGroup cgi-user cgi-group`

4. (*10 marks*)

i) (*5 marks*) In the ABC Company, browsers, each with its own browser cache, are configured to forward HTTP requests to the company's forward proxy, which also has a cache. Explain in detail all the ways in which this arrangement can reduce the time between a user clicking on a hyperlink and the user seeing the response.

ii) (*5 marks*) The XYZ company runs an Apache Web server (including `mod_alias`) on a backend host, `backend.xyz.ie`. It also runs an Apache Web server configured as a reverse proxy (using `mod_proxy` and `mod_proxy_http`) on another host, `www.xyz.ie`.

The `httpd.conf` of `backend.xyz.ie` includes:

`ServerName backend.xyz.ie`
`DocumentRoot /htdocs`
`Redirect permanent /logo.gif http://backend.xyz.ie/new-logo.gif`

Each of the following is to be found in the `httpd.conf` file of `www.xyz.ie`. Explain what each does:

a. `ProxyRequests Off`

b. `ProxyPass /images backend.example.ie`

c. `ProxyPassReverse /images backend.example.ie`