## netkit lab

**web server and browser**

<table>
<thead>
<tr>
<th>Version</th>
<th>1.2</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td><strong>Web</strong></td>
<td><a href="http://www.netkit.org/">http://www.netkit.org/</a></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>A lab showing the operation of a web server accessed by a browser client</td>
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lab topology

client

2

eth0

10.0.0.0/24

A

1

eth0

server

netkit – [ lab: webserver ]

last update: Nov 2012
lab description

- server
  - runs apache2 (with a default configuration)

- client
  - the user can launch a text-based web browser (links) to check the server operation
the user can check that apache2 is up and running by using the following command:

```
server:~# /etc/init.d/apache2 status
Apache is running (pid 485).
```

the default apache2 setup offers a test html page, located in

```
/var/www/index.html
```

```html
<html><body><h1>It works!</h1></body></html>
```
the user is supposed to start the web browser **links** on the client

an empty screen is presented to the user...

to access the menu bar, press F10

using the cursor keys, select “Go to URL” and press Enter
client

- enter the following URL:
  
  http://10.0.0.1/

- you should get a screen saying “It works!”
server (again)

- to monitor accesses to the web server you can use the following command (on the server):

```
server:~# tail -f /var/log/apache2/access.log
10.0.0.2 - - [19/Oct/2011:08:04:08 +0000] "GET / HTTP/1.1"
200 56 "-" "Links (2.2; Linux 2.6.26.5-netkit-K2.8 i686; 80x39)"
```
server (again)

- to monitor errors on the web server you can use the following command (on the server):

```
server:~# tail -f /var/log/apache2/error.log
[Wed Nov 14 15:57:58 2012] [notice] Apache/2.2.9 (Debian) configured -- resuming normal operations
[Wed Nov 14 16:14:07 2012] [notice] caught SIGTERM, shutting down
```

tip: very useful when debugging configurations
apache modules

- most of apache’s functionalities are built-in
  - retrieve the list using `apache2 -l`
- others can be added by enabling modules
  - to enable a module:

```bash
server:~# a2enmod rewrite
Enabling module rewrite. 
Run '/etc/init.d/apache2 restart' to activate new 
configuration!
server:~# 
```

⚠️ apache must be (re)started afterwards
apache modules

- Available modules are located in `/etc/apache2/mods-available`.
- Enabled modules are located in `/etc/apache2/mods-enabled`.
- `a2enmod` puts a symbolic link from the relevant file(s) in `/etc/apache2/mods-available` to `/etc/apache2/mods-enabled`.
- `a2dismod` removes these symbolic links.
some useful apache modules

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>userdir</td>
<td>enables per-user web sites</td>
</tr>
<tr>
<td>rewrite</td>
<td>implements URL rewriting</td>
</tr>
<tr>
<td>proxy</td>
<td>implements a proxy/gateway</td>
</tr>
<tr>
<td>cgi/cgid</td>
<td>supports execution of CGI scripts</td>
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per-user web sites

- enable module **userdir**

  ```
  server:~# a2enmod userdir
  Enabling module userdir.
  Run '/etc/init.d/apache2 restart' to activate new configuration!
  server:~#  
  ```

- by default, **userdir** looks for per-user sites in `/home/username/public_html`

  - check file
    `/etc/apache2/mods-enabled/userdir.conf`
exercise: per-user web sites

- hands-on:
  - create directory `/home/guest/public_html` on server
  - put a simple `index.html` inside that directory
  - check operation of the user web site by accessing `http://10.0.0.1/~guest/` from client
per-directory configuration

- Apache allows configuration changes on a per-directory basis.
- Creating a special file `/some/path/.htaccess` with Apache configuration statements applies those statements to all files and subdirectories inside `/some/path`.
  - `.htaccess` files can be nested in a directory tree.
  - Nested files override their parents.
per-directory configuration

- sample configuration statements:
  - restrict access from specific hosts
    
    ```
    Deny from example.org test.com 10.0.0 192.168.0.0/24
    ```
  - perform URL rewriting
    - (transparent) redirect to other sites
  - restrict access to a specific subdirectory
    - enable client-side authentication
  - change name of file containing the default page
    
    ```
    DirectoryIndex pippo.html
    ```
  - enable/disable directory indexing
    
    ```
    Options -Indexes
    ```
exercise: per-directory configuration

- when a resource name is not specified in the URL, apache serves `index.html` from the requested path

- hands-on:
  - edit file `/home/guest/public_html/.htaccess` and add the following directive:
    ```
    DirectoryIndex custom_file.html
    ```
  - rename previously created file `/home/guest/index.html` to `custom_file.html`
  - try accessing `http://10.0.0.1/~guest/` from client
  - rename `custom_file.html` back to `index.html` and try accessing the page again