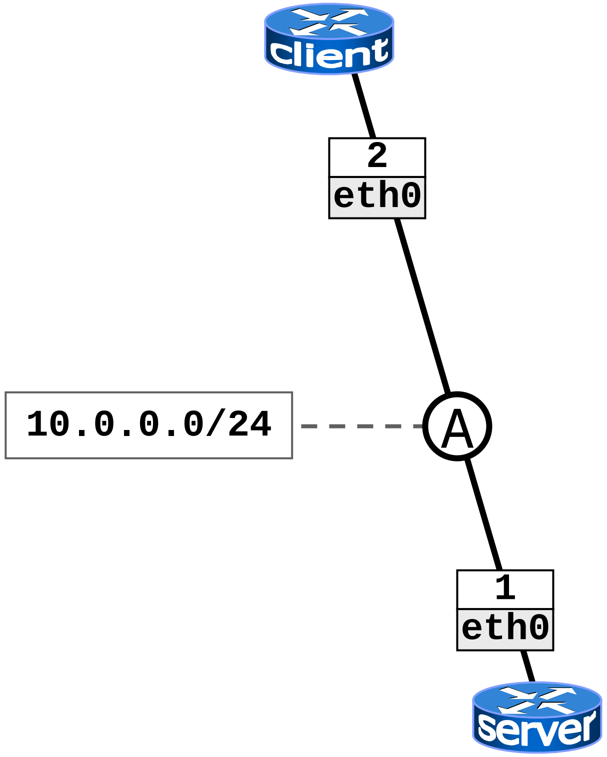
netkit lab

web server and browser

Version	1.2
Author(s)	Giuseppe Di Battista, Maurizio Patrignani, Massimo Rimondini
E-mail	contact@netkit.org
Web	http://www.netkit.org/
Description	A lab showing the operation of a web server accessed by a browser client

copyright notice

lab topology

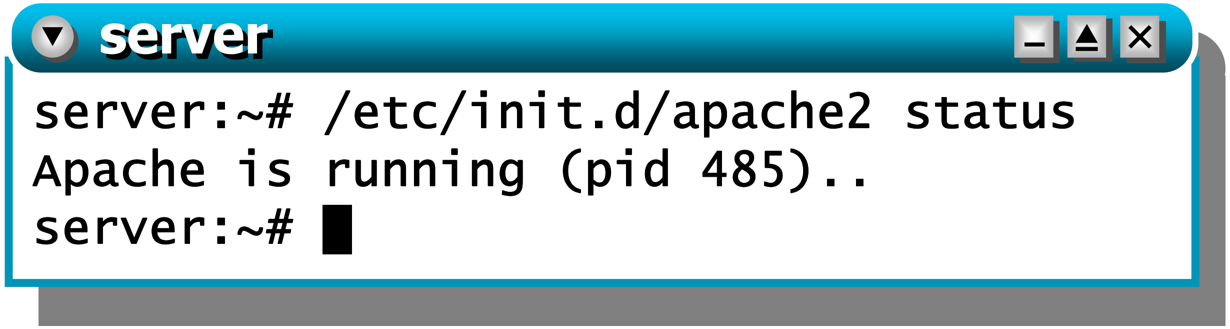


lab description

- server
  - runs apache2 (with a default configuration)
- client
  - the user can launch a text-based web browser (**`links`**) to check the server operation

server

- the user can check that apache2 is up and running by using the following command:



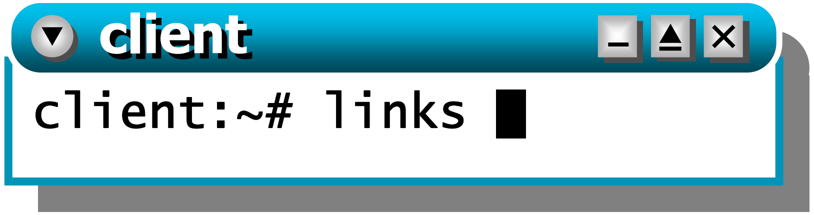
```
server:~# /etc/init.d/apache2 status
Apache is running (pid 485)..
server:~# █
```

- the default apache2 setup offers a test html page, located in **`/var/www/index.html`**

```
<html><body><h1>It works!</h1></body></html>
```

client

- the user is supposed to start the web browser **`links`** on the client



```
client:~# links █
```

- 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

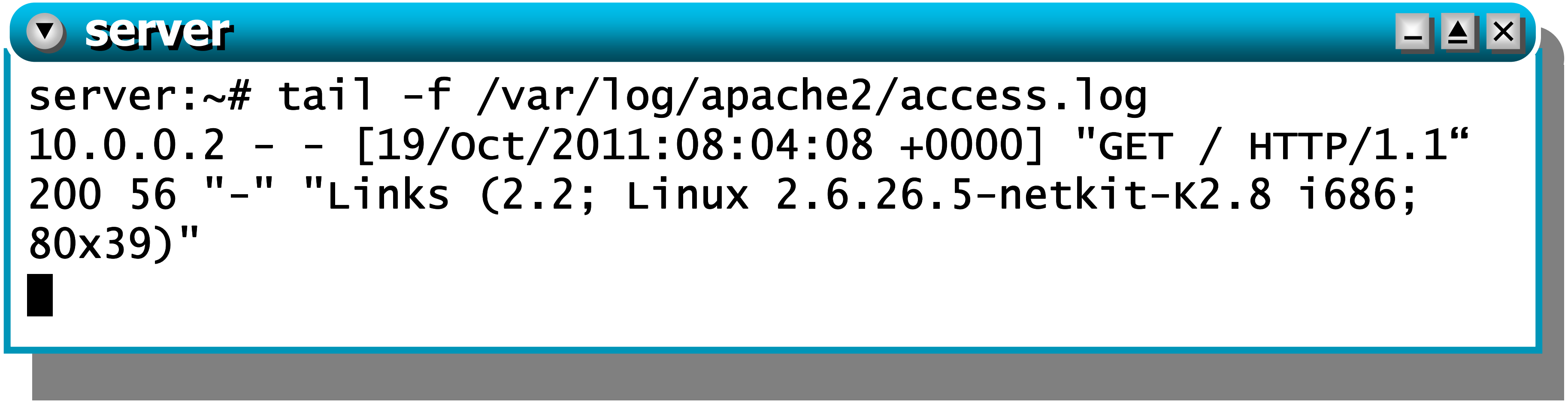
- enter the following URL:

  `http://10.0.0.1/`

- you should get a screen saying “It works!”

server (again)

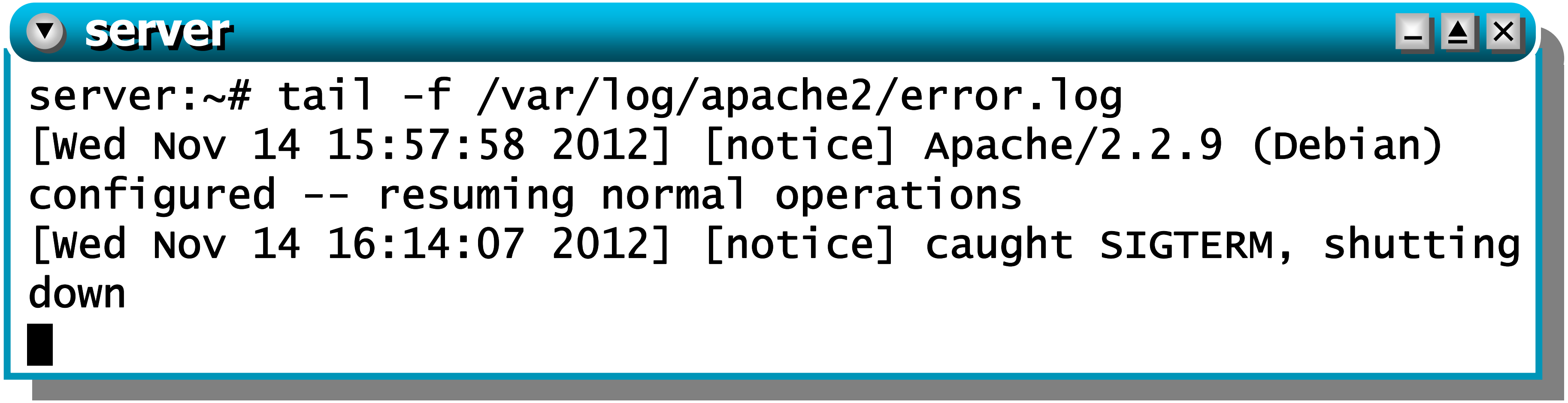
- to monitor accesses to the web server you can use the following command (on the server):



```
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):

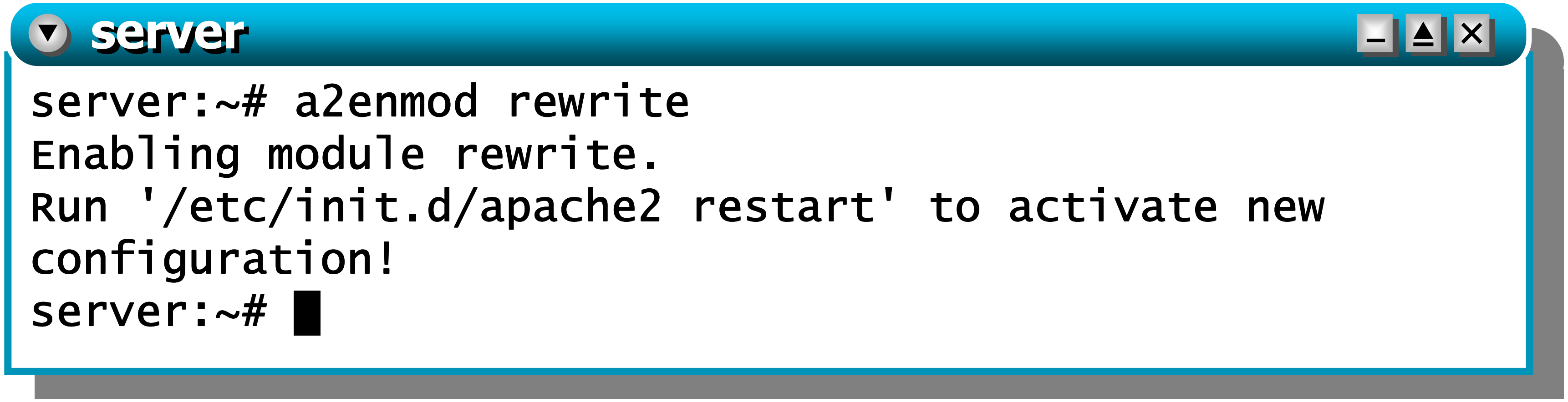


```
server:~# tail -f /var/log/apache2/error.log
[Wed Nov 14 15:57:58 2012] [notice] Apache/2.2.9 (Debian)
configured -- resuming normal operations
[Wed Nov 14 16:14:07 2012] [notice] caught SIGTERM, shutting
down
█
```

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:



```
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

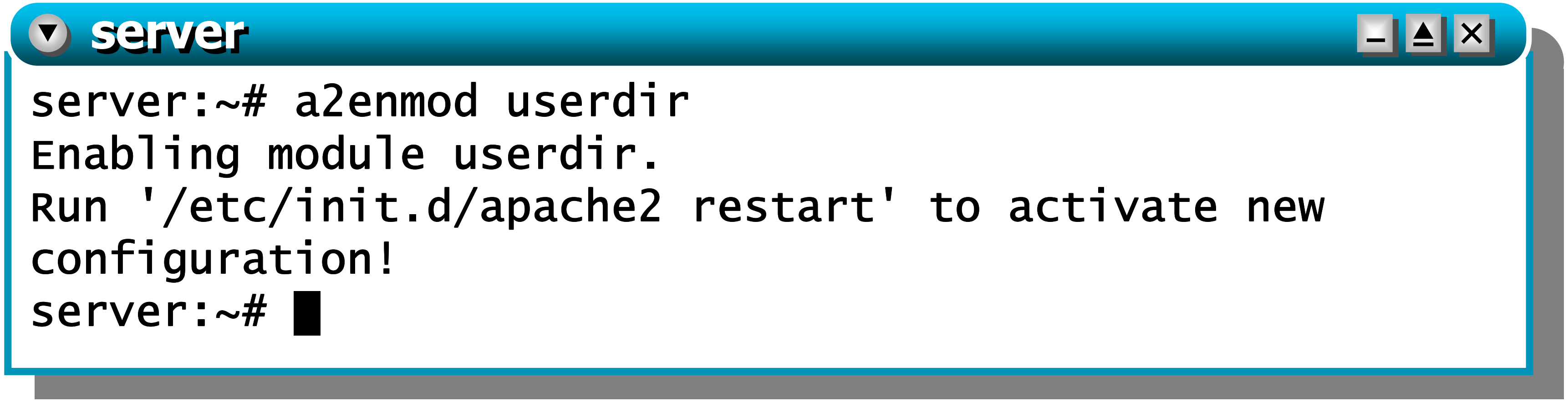
- available modules are located in **`/etc/apache2/mods-available`**
- enabled modules are located in **`/etc/apache2/mods-enabled`**
- **`a2enmod`** puts a symbolic link from the relevant file(s) in **`/etc/apache2/mods-available`** to **`/etc/apache2/mods-enabled`**
- **`a2dismod`** removes these symbolic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

some useful apache modules

`userdir`	enables per-user web sites
`rewrite`	implements URL rewriting
`proxy`	implements a proxy/gateway
`cgi/cgid`	supports execution of CGI scripts

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