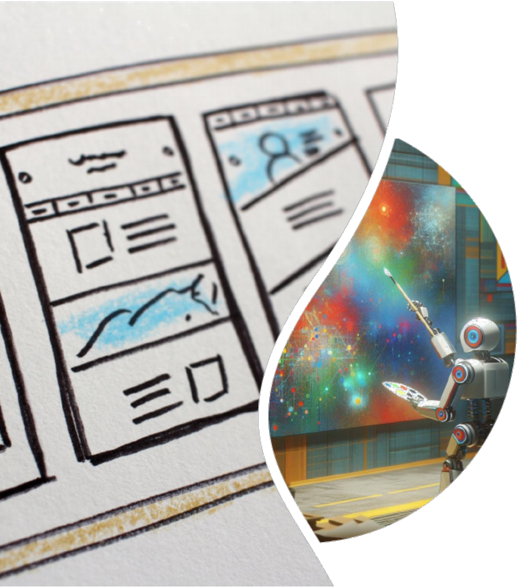

DGIN 5201
Digital Transformation
Lecture 3

Lab 1: Simple Web Experiments

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Time and date: 11:35–12:25 and 13:05–13:55, 10-Jan-2025

Location: Goldberg CS 134 and 143

Image: DALL-E. Bing Image Creator. Generated by AI

Using timberlea Server

- ssh login into timberlea.cs.dal.ca
- Windows: you can use the program PuTTY
  - other options available; e.g., MobaXterm
- On Mac: open a Terminal and type:

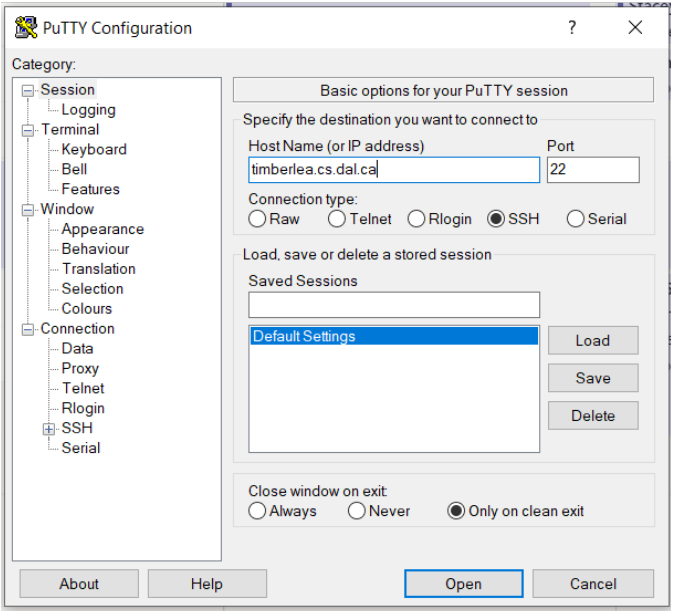
  ```
  ssh <your_csid>@timberlea.cs.dal.ca
  ```

  where instead of <your_csid> you should use your own CSID
- On Linux: similarly to Mac, you open the terminal and type the same command:

  ```
  ssh <your_csid>@timberlea.cs.dal.ca
  ```

Running PuTTY

- Double-click the PuTTY icon, and the following window should appear:



Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): timberlea.cs.dal.ca

Port: 22

Connection type:
○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

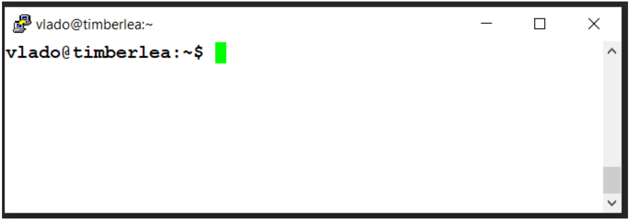
Saved Sessions

Default Settings

Close window on exit:
○ Always ○ Never ● Only on clean exit

Hands-on Exercises

- You should use PuTTY or another client to login to `timberlea`
- FileZilla is a good tool to copy files back and forth, but does not provide access to command-line (shell)
- The following exercises should be finished and will be graded as a part of Assignment 1
- Example of command-line (bash shell) access:



```
vlado@timberlea:~$
```

Creating a Simple Web Page

- Try command: `pwd`
- Enter directory: `public_html`
- Create directories: `dgin5201/e1`
- Set permissions for this directory to be all-accessible: `chmod` command
- Go to directory `dgin5201/e1` and create file `index.html` with the following content:

```
<html><body>
This is a very small HTML file.
</body></html>
```

- Make `index.html` all-readable and access it over Web

Opening Web Page in a Browser

- Check that the page works; using Web browser open URL `https://web.cs.dal.ca/~<your_csid>/dgin5201/e1`
- Review the process of obtaining a web page

Concepts Review: Example 1

- `ssh` access, PuTTY, `bash` shell
- `bash` commands: `pwd`, `ls`, `cd`, `mkdir`, `chmod`, `rmdir`
- File permissions
- Text editors: `emacs`, `vi`, `pico`, `nano`, or use remote editing: FileZilla, `vscode`
- Emacs editor:
  `emacs index.html` or `emacs -nw index.html`
  `C-x C-s` to save, `C-x C-c` to exit, `C-h t` to go through simple tutorial (`C-` means Ctrl and other key)
- HTML: simple tags, `html`, `body`
- Web and HTTP access

Requirements of e1

- At the end of Example 1 (e1), there should be the following directories (folders), files and their permissions:

```
~/public_html/dgin5201                 rwx--x--x
~/public_html/dgin5201/e1              rwx--x--x
~/public_html/dgin5201/e1/index.html rwxr--r--
```

- Content of `index.html` was given previously

File Permissions Review

- Each file or directory has user owner and group owner (group of users)
- Permissions defined for: user, group, other
- Each of these have three permissions: `rwx` — read, write, execute
- For directories ‘execute’ means actually access
- Examples of using chmod: `chmod 664 file.txt`

```
chmod og-r file.txt
chmod u+x,og+r file.txt
chmod u=rw,og= file.txt
chmod a+r file.txt; chmod -R u+r+w+X dir1
```

Example e2: User Registration, Printable Page, Files Shared

- Consider a Conference Management System: *CoMS*
- Let us build a conference registration form
- We also want to provide them with some material
- First iteration: Create a printable form
- Create directory `public_html/dgin5201/e2`
- Go to that directory
- Add file `index.html` (content to be given)
- Make sure that the permissions of e2 are `rwx--x--x`, and of `index.html` are `rwxr--r--`

Example 2: public_html/dgin5201/e2/index.html

```
<html><head><title>Conference Registration</title></head>
<body>
<h1>Conference Registration</h1>

<p>This is a registration page for CoMS.<br/>
For additional documents, please check <a
href="material">here</a>.<br/>
Please enter your information below to register:

<table>
<tr><th align=right>First and last name:</th>
<td>_______________________________</td></tr>
<tr><th align=right>Email:</th>
<td>_______________________________</td></tr>
<tr><th>Area of Interest (DB, HI, DS):</td>
<td>_______________________________</td></tr>
</table>
```

Example 2: Make material available

- Create readable and accessible (‘executable’) directory `material` (permissions: `rwxr-xr-x`)
- Copy PDF from: `~vlado/public/dt-mini-conf.pdf` into directory `material`
- Setup permissions for the directory `material` to be all readable and accessible (`rwxr-xr-x`), and for the file `dt-mini-conf.pdf` to be all readable (`rw-r--r--`)
- Try to access material link on the page. Does it work? Why?

Example 2: Prepare `.htaccess` in `material` directory

- Prepare file `.htaccess` and make it all readable (`rw-r--r--`):

```
Options Indexes
```

- Check material access now
- Add the following line to `.htaccess` and try accessing again:

```
Options Indexes
AddDescription "DT Conference Poster (PDF)" dt-mini-conf.pdf
```

- Add “and Information” to “DT Conference Poster” and access
- Add the following line and try again:

```
Options Indexes
IndexOptions DescriptionWidth=*
AddDescription "DT Conference Poster..." dt-mini-conf.pdf
```

- `.htaccess` file is used to configure Apache web server behaviour
    - can be used to provide a simple password-protected access

Concepts Review: Example 2

- Creating something that looks like form when printed
- HTML tags: `head, title, h1, p, br, a, table, tr, th, td`
- HTML attribute: `<th align=right> <a href="...">`
- bash shell: `cp`, using path, `~vlado`
- Accessing directory via browser
- `.htaccess` file for the Apache server: `Options Indexes, AddDescription`

Example e3: Next Iteration of Our Site: Password Protection

- Let us make a copy of our e2 site
- First, go back to the directory above e2:

  ```
  cd ../..
  ```

- Use command `pwd` to check your directory
- Copy e2 to e3 as an exact copy:

  ```
  rsync -av e2/ e3/
  ```

- Check the new site e3 in the browser
- `rsync` is a very useful utility for copying directory structures
  - it works locally as well as over ssh
  - it copies incrementally differences, which is important if two sites are large and mostly equal

Example 3: Simple Password Protection

- cd to e3 directory and let us prepare a password
- In a locally-only readable file pw (rw-------) we can save a password for our reference: dt dt5201
- Prepare the password for the site using the command:

```
htpasswd -bc .htpasswd dt dt5201
```

- Make the file .htpasswd all-readable and check its contents
- Prepare the file .htaccess and make it all readable:

```
AuthType Basic
AuthName dgin5201
AuthUserFile /users/webhome/<your_csid>/dgin5201/e3/.htpasswd
AuthGroupFile /dev/null
<Limit GET POST>
require user dt
</Limit>
```

- Check that site is password-protected

Summary of e3

- Files and permissions copied from e2
- `pw` file with permissions `rw-------`
- `.htpasswd` file with permissions `rw-r--r--` and appropriate content set up with the `htpasswd` command
- `.htpasswd` file with permissions `rw-r--r--` and content set up for password protection as given in class

Concepts Review: Example 3

- `rsync` command, `-av` options
- `htpasswd` command, password saved as hash
- Using `.htaccess` for password-controlled access

Unix-style Customization

- Unix-style customization is typically text-based
- Example: bash customization
  - aliases: rm, mv, cp, em
  - .profile and .bashrc files
- Example: Emacs customization
  - .emacs file
- Earlier example: Apache customization
  - .htaccess, .htpasswd files

Aside: Touch Typing

- If you don't use touch typing, consider learning it
- A relatively simple and not popular skill, but
  - actually important, and even more and more relevant

Example e4: Introducing a Form

- With `rsync` copy e3 to e4, update .htaccess file
- Change the table part of `index.html` to:

```
<form>
<table>
<tr><th align=right>First and last name:</th>
<td><input type="text"></td></tr>
<tr><th align=right>Email:</th>
<td><input type="text"></td></tr>
<tr><th>Area of Interest (DB, HI, DS):</td>
<td><select><option>DB</option><option>HI</option>
  <option>DS</option></select></td></tr>
 </table>
 </form>
```

- Check the page and see that this is usable fillable form, which can be printed

Concepts Review: Example 4

- Creating fillable form in HTML: `<form>...<form>`
- `<input type="text">`
- `<select><option>op1</option>...</select>`

Summary of e4

- Files set up as in e3
- `index.html` modified to make a usable fillable form