REPORT ON THE USE OF MULTIPLE VIRTUAL MACHINES

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Problem Description

Build an application using multiple virtual machines which interact.

The application should be developed within a git repository, allowing other developers to modify and build upon your application.

The Interaction of My Virtual Machines

For my assignment I used Vagrant to build three virtual machines.

I began by using the Lecturer's example from Lab 6 (https://altitude.otago.ac.nz/cosc349/vagrant-multivm). I used this example to create two virtual machines which allowed a web server and a database server to interact.

I then created a third virtual machine, which was a second web server.

Virtual Machine 1 = WebServer1
Virtual Machine 2 = Database Server
Virtual Machine 3 = Webserver3

WebServer1 is the index page of the web site. WebServer1 reads data from the Database Server, creates a table and an options box from this data, which is presented to the client on the web page index.php.

The client selects an option from the options box and upon selection will be presented with a link to another web page, which details a specific stained glass window type, hosted on WebnServer2.

This web page (stained glass window type) is also read-only (i.e. only reads from the Database Server) and includes a table and an options box.

The client selects an option from the options box and upon selection will be presented with another read-only web page (quantity.php), hosted on WebServer2. This webpage reads from the Database Server and informs the client of his / her selected options so far. The webpage also presents the client with one final options box, whereby the client selects a quantity.

After selecting a quantity, the client is presented with the web page order.php. This web page is also hosted on WebServer2 but is read-write i.e. it writes into the Database Server and the reads the adjusted data from the Database Server.

Note: as the stained glass window type web page (astrological.php, coloured_tree.php, gothic.php, red_plant.php or religious.php) hosted on WebServer2 reads from the same Database Server as order.php, the data in the stained glass window type table will have changed from the time the client first entered that specific web page.

Reasons for the use of Three Virtual Machines

Reason 1

Webserver1 hosts index.php and nothing else. index.php is the client entry point into the web site and will generally contain the bulk of the traffic.

Having index.php on its own separate web server will allow elasticity (i.e. the ability to scale up the host web server(s) ability to handle client load) should the company introduce a reduction in the prices of its stock, inducing a sudden surge in traffic.

Reason 2

The page hosted on WebServer1 (index.php) is read-only, while the pages hosted on WebServer2 are read-only and read-write.

As read-write web pages are a possible channel for possible malicious intent from any client, I decided to isolate any read-write pages on a separate server, away from the webpage having the most client traffic (i.e. index.php).

If there is any corruption in the data hosted on the Database Server, having separate web servers for different types of client traffic will help find the cause and the solution to the corruption.

Download Times

As the website is basic, download times are minimal. Images will be cached after the client accesses the website after the first time.

Note: I found this caching a problem as I was developing my website. As I was new to cloning I was testing my website through Linux. When it came to cloning my git repository, I had not copied the webpage images into the repository. When I did a clone from my repository and uploaded my web pages the images were uploaded into my webpage through the caching (even though they would not have been in the cloned file).

To Start my Application

Create a new directory
Move into that directory
Clone the git repositoty: git clone https://github.com/houseofcard/assignment1
Move into the assignment1 directory
vagrant up

To Use My Application

The entry to the application is index.php hosted on the address: 127.0.0.1:8080 (127.0.0.1:8081 is the address of the second web server).

index.php

Choose a Window Type from the options box (click 'Create Link').

A link will appear.

Click on the link which you link you to one of the following pages depending on the choice you made regarding the options box.

astrological.php, coloured_tree.php, gothic.php, red_plant.php or religious.php

Note the Stock Available in the table.

Choose a Size from the options box (click 'Select a Size').

quantity.php

Choose a Quantity from the options box (click 'Quantity Selected').

order.php

Note the change in Stock Available in the table reflecting the quantity selected by the client and the reduction in stock now available.

Modifications

Modification 1

Currently there are two css files (one for each web server). Perhaps another developer could create just one css for the website, reducing the need for duplication and reducing the possibility of errors should the css files need to be adjusted (i.e. having to make sure you change both css files should you want to change the presentation of the web site).

Modification 2

WebServer2 could include a webpage with the capacity for the client to enter their details (e.g. address for delivery and installation of the chosen stained glass windows). This information will be stored in the Database Server.

Issues With Modifications

After the medications the developer would destroy the previous virtual machines (vagrant destroy), clone the adjusted repository and then create a new batch of virtual machines (vagrant up).

However before doing this, the developer must create a copy of the current database and use that copy for the set-up database.sql file located in the git repository. This will ensure database history (e.g. client information) is not lost.

Repository Details

Repository: GitHub
Username: houseofcard
Repository Name: assignment1

Final CommitID:

I was unsure of how to commit different files into different directories with the one commit (and as it was late in the assignment process I did not want to experiment for fear of losing all my files).

So all the files in a directory have a common latest commitID I tried to reload the files (in my pages directory), with there been no adjustments to the actual code in the files.

It appears, looking at my screen that Github would not allow me to do this.

So I have the following commitIDs to be marked –

Files in the www directory: cd3043d

Files in my pages directory I have two latest commitIDs: 7fa770b and b6cd90c.

For my main directory I have a variety of latest commits
Vagrantfile: ee6a447
setup-database.sql: e8a29b9
test-website.conf: fdf98c9
test-website2.conf: ee6a447
,gitattributes: 120693b
.gitignore: b0fa592