Project 1 : Multi tier web application stack.

- ⇨ Setup is locally (On laptop or on desktop).
- ⇨ This project is a baseline for upcoming projects.
- ⇨ Setup any project locally.

Scenario:

Working in a project => having varieties of services that power the project runtime.

Problem:

Not comfortable in making changes in real systems!! So you would like to set up that entire stack (multiple servers) on your local machine probably by using VMs. But the local setup is complex, time consuming and not repeatable.

Solution:

We will have a local setup but it will be automated, repeatable (IAAC, if you have a code to setup the entire stack locally we can do it as many as times, and we can do as much as R&D we want on our local machine).

Tools:

Hypervisor: -Virtual Box on which we are going to setup the VM.

Automation: -Vagrant.

CLI: - Git bash to run commands.

IDE: - Sublime text.

Objective:

- ⇨ Learn VM automation locally.
- ⇨ Baseline for upcoming projects.
- ⇨ Setup real world projects locally.

Architecture of project services:

- ⇨ NGINX => TOMCAT => RABBITMQ => MEMCACHED => MYSQL

Architecture of automated setup:

- ⇨ VAGRANT => VIRTUALBOX => GITBASH

Architectural design:

After setting up the stack, user can access all services from browser by entering IP@ => User will be directed to load balancers (Nginx server will act like a load balancer) => Nginx server forwards the request to app server (Apache Tomcat) where the java app will be running => We can have a shared storage by using NFS => App server forwards the request to RABBITMQ (it will be our message broker) => That will send a request to MEMCACHED for DB caching => MEMCACHED is going to cache the SQL queries.

Flow of executions:

1. Setup tools.
2. Clone source code.
3. Cd into the vagrant dir.
4. Bring up VM's.
5. Validate.
6. Setup all the services.
    a. **Mysql.**
    b. **Memcached.**
    c. **Rabbit MQ.**
    d. **Tomcat.**
    e. **Nginx.**
    f. **App Build & Deploy**.
7. Verify from browser.

Vagrant will use the config to launch 5 VMs : 1 Nginx, 1 Tomcat, 1 RabbitMQ, 1 Memcached, 1 DB.

First we are going to setup all the services manually to understand it very well, then we are going to use bash scripts to set up all those things automatically.

A good practice when you are provisioning an operating system first time; you batch with the latest packages with the command : yum update /y . It is better if you do this in all the VMs.

To wrap up :

We used vagrant to creat Vms automatically on Vbox , we log in to each VM to execute shell commands and set up services(rabbitMQ, …).

Once the access is ready, we validate from the web browser the access to nginx server, Nginx is successfully routing the request to our app server (tomcat) which then forwarded the msg to msg broker rabbiMQ, then to memcached, and then to mysql server.

This is the manual set up, we will see the automated set up files in the other directory.