

EPAM Systems, RD Dep., RD Dep.

MTN.*NIX Packer

REVISION HISTORY					
Ver.	Description of Change	Author	Date	Approved	
				Name	Effective Date
<1.0>	Initial revision	Siarhei Beliakou	06-Feb-2019		

Lab Work Task. Backing VM Image with Packer

Review

Create custom VM image with Packer and shell scripts.

Developing Immutable Infrastructure

Task

1. Install Packer using cmd utilities (such as wget/curl/unzip/etc)

```
[student@EPBYMINW5249 tmp]$ sudo ln -s /usr/local/packer /usr/bin/packer
[student@EPBYMINW5249 tmp]$ packer --version
1.4.1
[student@EPBYMINW5249 tmp]$ █
```

```
[student@EPBYMINW5249 tmp]$ wget https://releases.hashicorp.com/packer/1.4.1/packer_1.4.1_linux_amd64.zip && sudo unzip -o packer_1.4.1_linux_amd64.zip -d /usr/local/ && sudo ln -s /usr
/local/packer /usr/local/bin/packer.io
--2019-06-11 11:46:27-- https://releases.hashicorp.com/packer/1.4.1/packer_1.4.1_linux_amd64.zip
Resolving releases.hashicorp.com (releases.hashicorp.com)... 151.101.193.183, 151.101.1.183, 151.101.65.183, ...
Connecting to releases.hashicorp.com (releases.hashicorp.com)[151.101.193.183]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 42958921 (41M) [application/zip]
Saving to: 'packer_1.4.1_linux_amd64.zip'

100%[=====] 42,958,921 6.38MB/s in 5.6s

2019-06-11 11:46:33 (7.28 MB/s) - 'packer_1.4.1_linux_amd64.zip' saved [42958921/42958921]
```

2. Develop Packer JSON Template (and necessary scripts/configs) for creating Custom CentOS (7.6 on board from official ISO)

Let us not attempt to “reinvent the wheel” :) . The modified part below on the screen (add my script in vagrant-centos-local.json and deleted “--noipv6; --append=”ipv6.disable=1 net.ifnames=0 biosdevname=0””, add --hostname in vagrant.ks):

```
1 install
2 cdrom
3
4 lang en_US.UTF-8
5 keyboard us
6 timezone UTC
7
8 network --onboot yes --bootproto=dhcp --device=eth0 --activate --hostname=nginx_tomcat
9
10 rootpw vagrant
11 authconfig --enablesdshadow --passalgo=sha512
12 user --name=vagrant --groups=vagrant --password=vagrant
13
14 firewall --disabled
15 selinux --disabled
16 firstboot --disabled
17
18 # Old cool eth0/eth1/... -> "net.ifnames=0 biosdevname=0"
19 bootloader --location=mbr
20 text
21 skipx
22
```

```
63
64 "post-processors": [
65   {
66     "output": "hbledi-vagrant-centos-{{user `redhat_release`}}.box",
67     "compression_level": "6",
68     "type": "vagrant"
69   }
70 ],
71
72 "provisioners": [
73   {
74     "type": "shell",
75     "execute_command": "{{.Vars}} sudo -S -E bash '{{.Path}}'",
76     "start_retry_timeout": "1m",
77     "expect_disconnect": true,
78     "pause_before": "5s",
79     "override": {
80       "centos-{{user `redhat_release`}}": {
81         "scripts": [
82           "scripts/base.sh",
83           "scripts/ngtom.sh",
84           "scripts/vagrant.sh",
85           "scripts/virtualbox.sh",
86           "scripts/cleanup.sh"
87         ]
88       }
89     }
90   }
91 ]
92 ]
93
```

3. Validate Template with the command `packer validate`

```
[student@EPBYMINW5249 packer-centos-template]$ packer validate -var-file=vars/centos-7.6.1810.json vagrant-centos-local.json
Template validated successfully.
[student@EPBYMINW5249 packer-centos-template]$
```

4. Create custom scripts:

- install & configure nginx (to forward http requests to application in tomcat)
- install & configure tomcat (run under tomcat user)
- build and deploy custom war file: <https://github.com/sbeliakou/hello-war/>

```
1 #!/bin/bash
2
3 yum install -y nginx
4 yum install -y tomcat
5 yum install -y maven git
6
7 sed -i -e "/^s.*location \{/ {s/s/\nproxy_pass http:\/\/127.0.0.1:8080\/mnt-lab\/;/} /etc/nginx/nginx.conf
8
9 cd /tmp
10 git clone https://github.com/sbeliakou/hello-war.git
11 echo "Build time: `date`" >> hello-war/src/main/resources/build-info.txt
12 echo "Build Machine Name: $HOSTNAME" >> hello-war/src/main/resources/build-info.txt
13 echo "Build User Name: $USER" >> hello-war/src/main/resources/build-info.txt
14
15 cd hello-war
16 mvn clean package -DbuildNumber=$BUILD_NUMBER
17 mv target/mnt-lab.war /var/lib/tomcat/webapps/
18 echo "Deployment time: `date`" > /var/lib/tomcat/webapps/deploy-info.txt
19 echo "Deploy User: $USER" >> /var/lib/tomcat/webapps/deploy-info.txt
20
21
22 systemctl enable nginx
23 systemctl enable tomcat
24
25 systemctl start nginx
26 systemctl start tomcat
```

```
[student@EPBYMINW5249 packer-centos-template]$ packer validate -var-file vars/centos-7.6.1810.json vagrant-centos-local.json
Template validated successfully.
[student@EPBYMINW5249 packer-centos-template]$ packer build -var-file vars/centos-7.6.1810.json vagrant-centos-local.json
centos-7.6 output will be in this color.
```

```
==> centos-7.6: Retrieving Guest additions
==> centos-7.6: Trying /usr/share/virtualbox/VBoxGuestAdditions.iso
==> centos-7.6: Trying /usr/share/virtualbox/VBoxGuestAdditions.iso
==> centos-7.6: /usr/share/virtualbox/VBoxGuestAdditions.iso => /home/student/BLEDAI/Beliakou/packer-centos-template/packer_cache/26fb5ce50fc4b178e2f2ab9965e7b69240ae8239.iso
```

```
centos-7.6 (vagrant): Compressing: packer-centos-vm-disk001.vmdk
centos-7.6 (vagrant): Compressing: packer-centos-vm.mf
Build 'centos-7.6' finished.

==> Builds finished. The artifacts of successful builds are:
--> centos-7.6: 'virtualbox' provider box: hbledi-vagrant-centos-7.6.box
[student@EPBYMINW5249 packer-centos-template]$ cd ../packer
```

5. Create Vagrantfile to spin up recently baked image.

```
1 Vagrant.configure("2") do |config|
2
3   ip=["192.168.68.69"]
4
5   servers=[
6     {
7       :hostname => "BLEDAI",
8       :ip => ip[0],
9       :box => "centos7.6_Hello.box",
10      :ram => 1024,
11      :cpu => 2,
12    }
13  ]
14
15  servers.each do |machine|
16    config.vm.define machine[:hostname] do |node|
17      node.vm.box = machine[:box]
18      node.vm.hostname = machine[:hostname]
19      node.vm.network "private_network", ip: machine[:ip]
20      node.vm.provider "virtualbox" do |vb|
21        vb.customize ["modifyvm", :id, "--memory", machine[:ram]]
22      end
23    end
24  end
25
26 end
27
28 end
```

```
[student@EPBYMINW5249 packer-centos-template]$ cd ../packer
[student@EPBYMINW5249 packer]$ vagrant box add -f ../packer-centos-template/hbledi-vagrant-centos-7.6.box --name centos7.6_Hello.box
==> box: Box file was not detected as metadata. Adding it directly...
==> box: Adding box 'centos7.6_Hello.box' (v0) for provider:
       box: Unpacking necessary files from: file:///home/student/BLEDAI/Beliakou/packer-centos-template/hbledi-vagrant-centos-7.6.box
==> box: Successfully added box 'centos7.6_Hello.box' (v0) for 'virtualbox'!
[student@EPBYMINW5249 packer]$ vagrant up
Bringing machine 'BLEDAI' up with 'virtualbox' provider...
==> BLEDAI: Importing base box 'centos7.6_Hello.box'...
Progress: 30%
```

6. Validate services in VM with curl commands

```
==> BLEDAI: Mounting shared folders...
       BLEDAI: /vagrant => /home/student/BLEDAI/Beliakou/packer
[student@EPBYMINW5249 packer]$ curl 127.0.0.1/
curl: (7) Failed connect to 127.0.0.1:80; Connection refused
[student@EPBYMINW5249 packer]$ curl 192.168.68.69/
<pre>
BUILD DETAILS:
Build time: Tue Jun 11 14:20:51 UTC 2019
Build Machine Name: nginx_tomcat
Build User Name: root

</pre>
<pre>
Deploy DETAILS:
Deployment time: Tue Jun 11 14:21:08 UTC 2019
Deploy User: root

</pre>
<img src='http://orig07.deviantart.net/763e/f/2008/366/a/0/homer_yahoo_by_danielgoettig.jpg'>
[student@EPBYMINW5249 packer]$ curl -IL 192.168.68.69/
HTTP/1.1 200 OK
Server: nginx/1.12.2
Date: Tue, 11 Jun 2019 14:29:31 GMT
Content-Type: text/html
Content-Length: 314
Connection: keep-alive
```

Report:

Send email with enclosed report:

Subject: [MNTLAB] Packer StudentName StudentSurname

To: Siarhei_Beliakou@epam.com

Attachment: StudentName_StudentSurname.pdf