

Web servers with load balancer in Azure cloud and deploying start page with Jenkins

EPAM DevOps Autumn 2021

About me

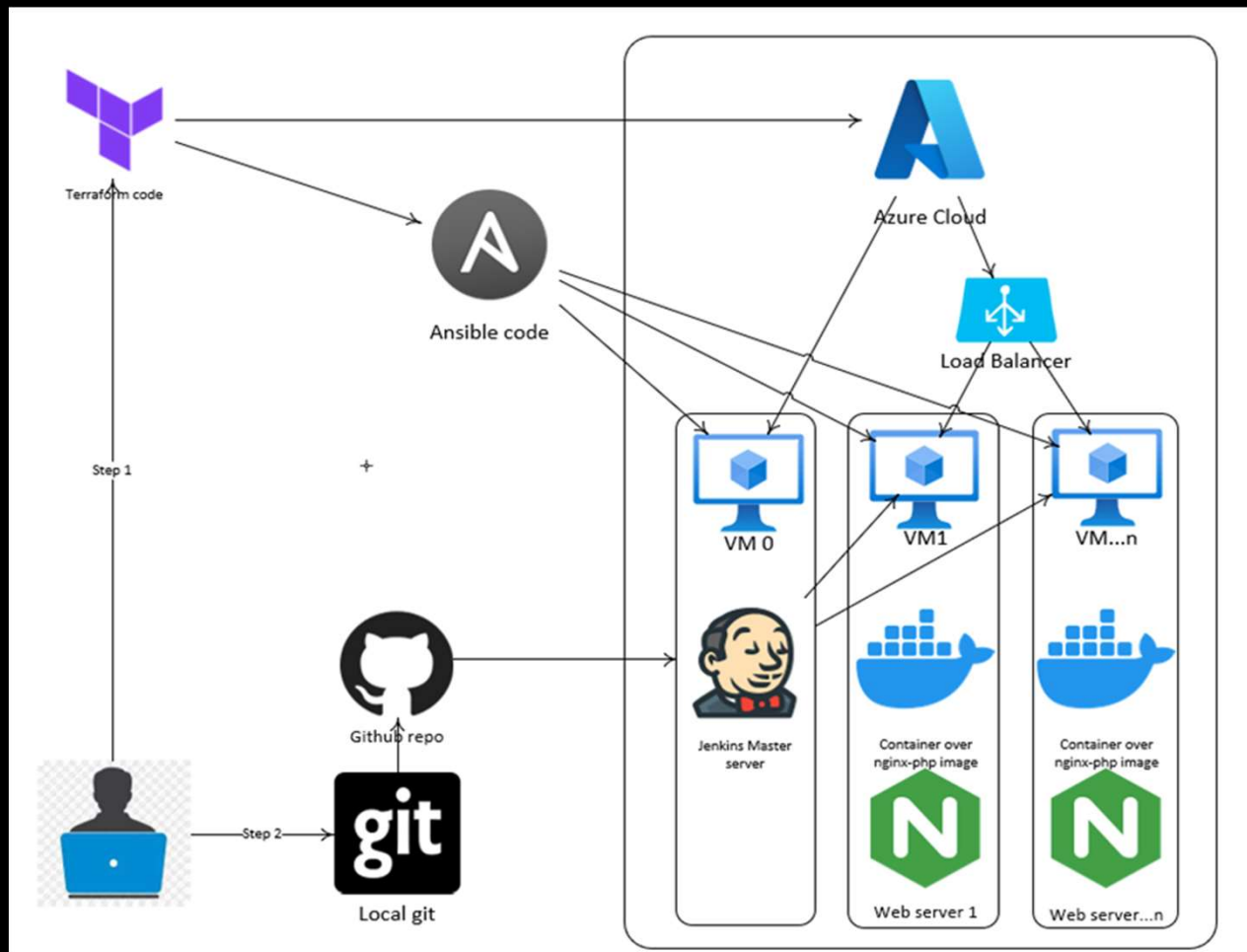
- IT infrastructure manager and engineer



- 15 years experience as a system administrator
- 10 years experience as 2-3 level support team lead and IT system manager in Ukrainian retail
- Management skills and technical background
- Creating fault-tolerant, high-load on-premise IT infrastructure. Using HP and Dell enterprise equipment with cluster hypervisors systems as MS Hyper-V and VMware vSphere.
- Strong Linux/Windows OS and networking skills
- Rapid learning of new technologies and improve skills
- Good problem solving abilities

About project

- Project scheme



About project

- This solution provide fast creation high availability frontend web server
- The project covers most of the lecture materials of this training course
- Project environment is created automatically by one command which starting terraform and ansible code
- The amount of web servers are set by a variable
- Web servers start in containers running over docker image - webdevops/php-nginx
- Deployment process copying start page to servers by Jenkins job

Demonstration - Build infrastructure

Variable “node count” set amount of virtual machines

```
variables.tf M x
infrastructure > variables.tf > variable "node_count"
1  variable "my_tenant_id" {
2    default = "2f6cfcdb-b0fe-417f-b8d9-0c6623467e0f"
3  }
4  variable "my_subscription_id" {
5    default = "f8a4d934-9d37-4994-b69c-c7f4c4b9cc72"
6  }
7  variable "resource_prefix" {
8    default = "tf-"
9    description = "Use also for fqdn. Only lowercase letters, numbers and hyphens"
10 }
11 variable "resource_location" {
12   default = "West Europe"
13 }
14 variable "node_count" {
15   default = "3"
16   description = "First will be Jenkins, other NGINXes"
17 }
18 variable "vm_size" {
19   default = "Standard_B1s"
20 }
21 variable "host_admin" {
22   default = "vmadm"
23 }
24 variable "environment" {
25   default = "My_test_task"
26 }
27 variable "vnet_space" {
28   default = "10.10.10.0/24"
29 }
```

Login to Azure subscription

\$ az login --use-device-code

\$ terraform plan -out=tfplan

\$ terraform apply "tfplan"

Apply complete! Resources: 24 added, 0 changed, 0 destroyed.

Outputs:

```
full_domain_name = [
  "tf-jenkins-00.westeurope.cloudapp.azure.com",
  "tf-target-01.westeurope.cloudapp.azure.com",
  "tf-target-02.westeurope.cloudapp.azure.com",
]
full_domain_name_load_balancer = "tf-lb-target.westeurope.cloudapp.azure.com"
public_ip_addresses = [
  "20.107.72.4",
  "20.123.134.221",
  "20.71.224.87",
]
tls_private_key = <sensitive>
```


Demonstration - Build infrastructure

Show all resources on AZURE portal

All resources

Каталог по умолчанию

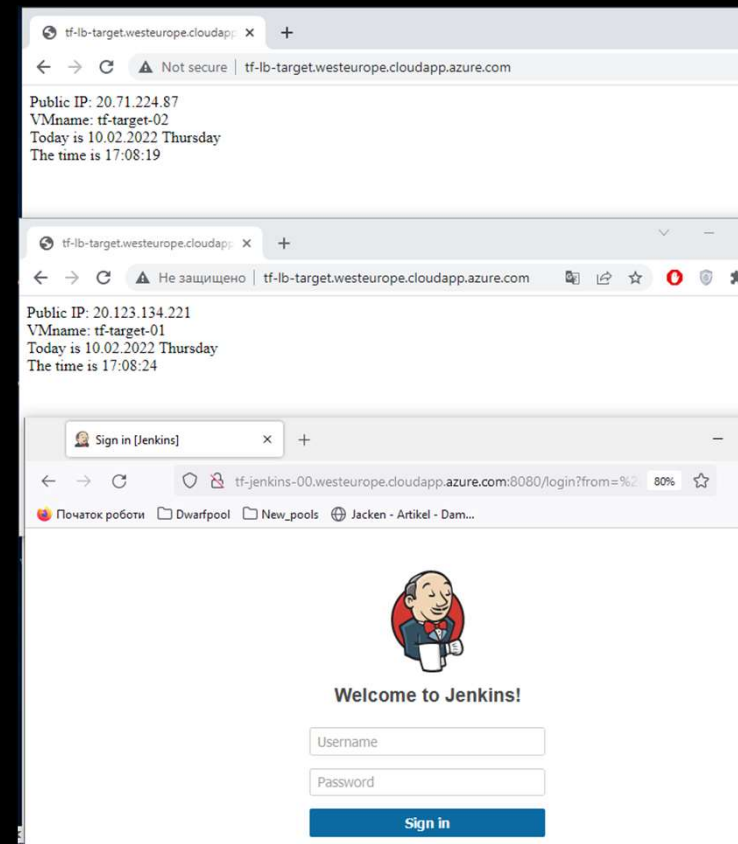
Create Manage view Refresh Export to CSV Open query Assign tags Delete

Filter for any field... Subscription == all Resource group == all Add filter More (2)

Showing 1 to 18 of 18 records. Show hidden types No grouping List view

Name	Type	Resource group	Location	Subscription
tf-Vnet	Virtual network	tf-ResourceGroup	West Europe	Azure subscription 1
tf-jenkins-00	Virtual machine	tf-ResourceGroup	West Europe	Azure subscription 1
tf-target-01	Virtual machine	tf-ResourceGroup	West Europe	Azure subscription 1
tf-target-02	Virtual machine	tf-ResourceGroup	West Europe	Azure subscription 1
tf-PublicIP-00	Public IP address	tf-ResourceGroup	West Europe	Azure subscription 1
tf-PublicIP-01	Public IP address	tf-ResourceGroup	West Europe	Azure subscription 1
tf-PublicIP-02	Public IP address	tf-ResourceGroup	West Europe	Azure subscription 1
tf-PublicIPB	Public IP address	tf-ResourceGroup	West Europe	Azure subscription 1
NetworkWatcher_westeurope	Network Watcher	NetworkWatcherRG	West Europe	Azure subscription 1
tf-NetworkSecurityGroup	Network security group	tf-ResourceGroup	West Europe	Azure subscription 1
tf-NIC-00	Network interface	tf-ResourceGroup	West Europe	Azure subscription 1
tf-NIC-01	Network interface	tf-ResourceGroup	West Europe	Azure subscription 1
tf-NIC-02	Network interface	tf-ResourceGroup	West Europe	Azure subscription 1
tf-LoadBalancer	Load balancer	tf-ResourceGroup	West Europe	Azure subscription 1
myOsDisk-0	Disk	TF-RESOURCEGROUP	West Europe	Azure subscription 1
myOsDisk-1	Disk	TF-RESOURCEGROUP	West Europe	Azure subscription 1
myOsDisk-2	Disk	TF-RESOURCEGROUP	West Europe	Azure subscription 1
avset	Availability set	tf-ResourceGroup	West Europe	Azure subscription 1

There is one Jenkins host and two target NGINX hosts
Requests for targets is sent to load balancer fqdn



Demonstration - Build infrastructure

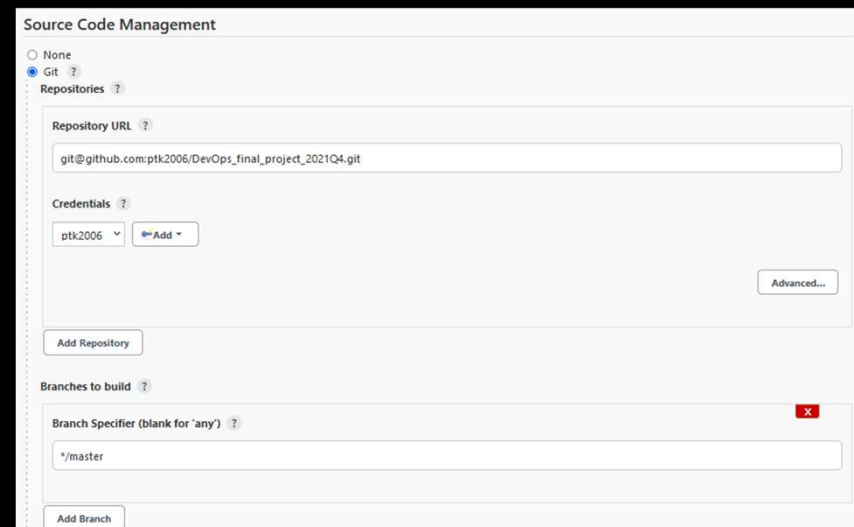
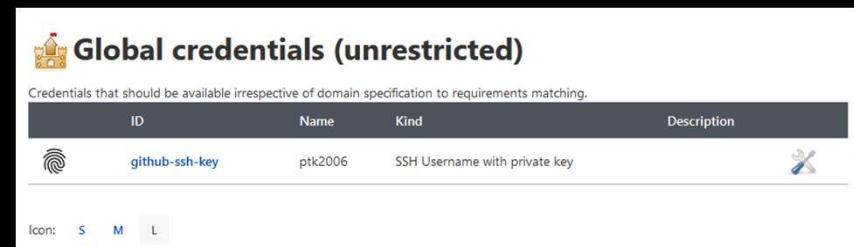
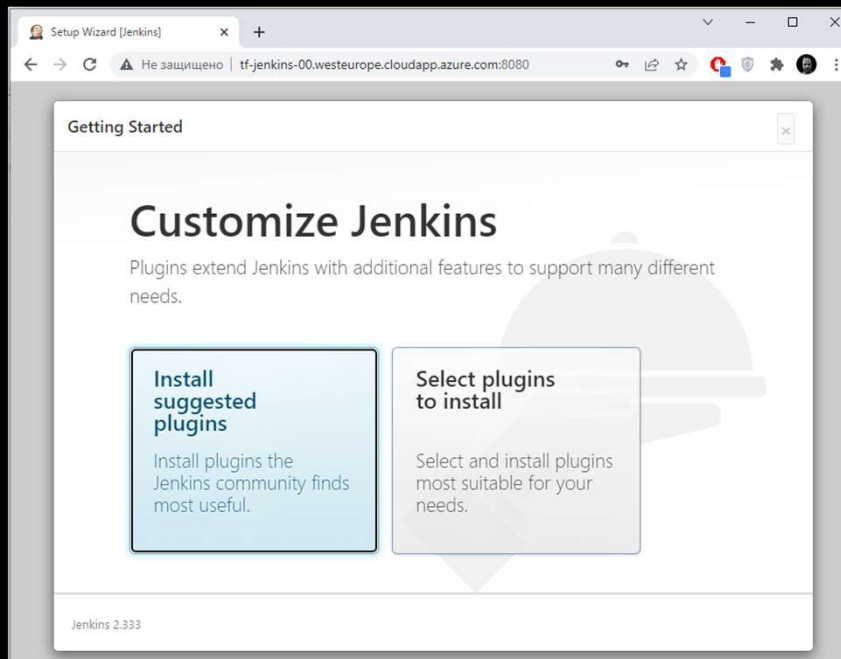
Docker container and image on target hosts

```
vmadm@tf-target-01:~  
[vmadm@tf-target-01 ~]$ sudo docker ps  
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES  
9623c2e7ccf8   webdevops/php-nginx:centos-7       "/entrypoint supervi..." 56 minutes ago Up 56 minutes 443/tcp, 0.0.0.0:80->80/tcp, 9000/tcp php-nginx  
[vmadm@tf-target-01 ~]$ sudo docker image ls  
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE  
webdevops/php-nginx  centos-7    107fdd9f2a3a  11 months ago  858MB  
[vmadm@tf-target-01 ~]$  
  
vmadm@tf-target-02:~  
[vmadm@tf-target-02 ~]$ sudo docker ps  
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES  
ffaceff181ed   webdevops/php-nginx:centos-7       "/entrypoint supervi..." 56 minutes ago Up 56 minutes 443/tcp, 0.0.0.0:80->80/tcp, 9000/tcp php-nginx  
[vmadm@tf-target-02 ~]$ sudo docker image ls  
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE  
webdevops/php-nginx  centos-7    107fdd9f2a3a  11 months ago  858MB  
[vmadm@tf-target-02 ~]$
```

Demonstration - Manual configure

There is no initial password. Credential sets in ansible playbook for Jenkins.

Create ssh credential for github hook



Demonstration - Results

Linux shell scp command for all target hosts

Activate ChuckNorris plugin

Changing index.php on local host

\$ git commit -a

\$ git push origin master

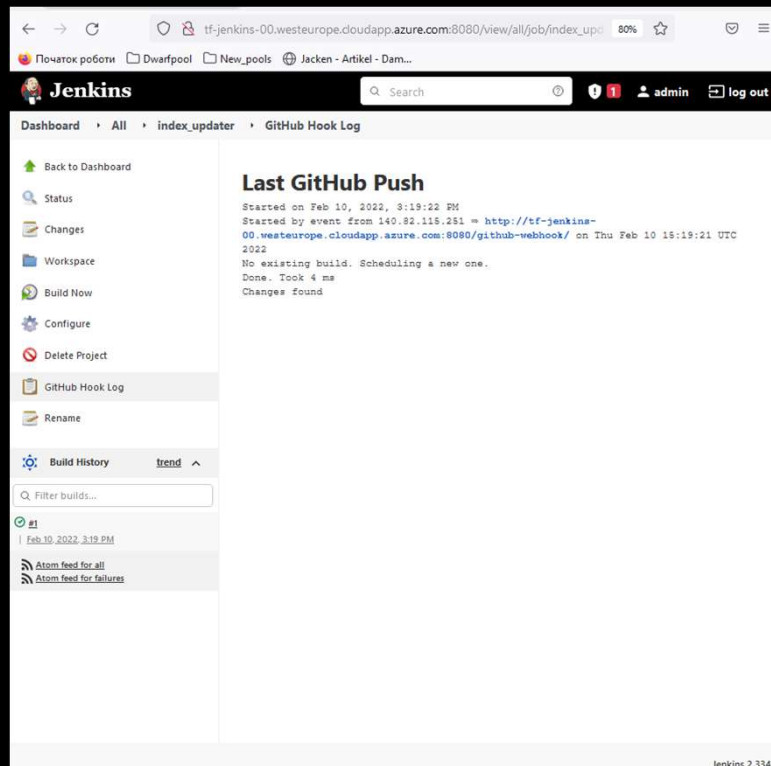
Chuck Norris says OK!

The screenshot shows the Jenkins configuration page for a job named 'index_updater'. It is divided into three main sections: 'Build Triggers', 'Build Environment', and 'Build'.
- **Build Triggers:** Includes checkboxes for 'Trigger builds remotely (e.g., from scripts)', 'Build after other projects are built', 'Build periodically', 'GitHub hook trigger for GITScm polling' (which is checked), and 'Poll SCM'.
- **Build Environment:** Includes checkboxes for 'Delete workspace before build starts', 'Use secret text(s) or file(s)', 'Abort the build if it's stuck', 'Add timestamps to the Console Output', 'Inspect build log for published Gradle build scans', and 'With Ant'.
- **Build:** Shows a single step named 'Execute shell' with a red 'X' icon. The command field contains a shell script that echoes a deployment message and uses 'scp' to copy 'index.php' to two target hosts in Azure CloudApp.
- **Post-build Actions:** Shows a single action named 'Activate Chuck Norris' with a red 'X' icon.

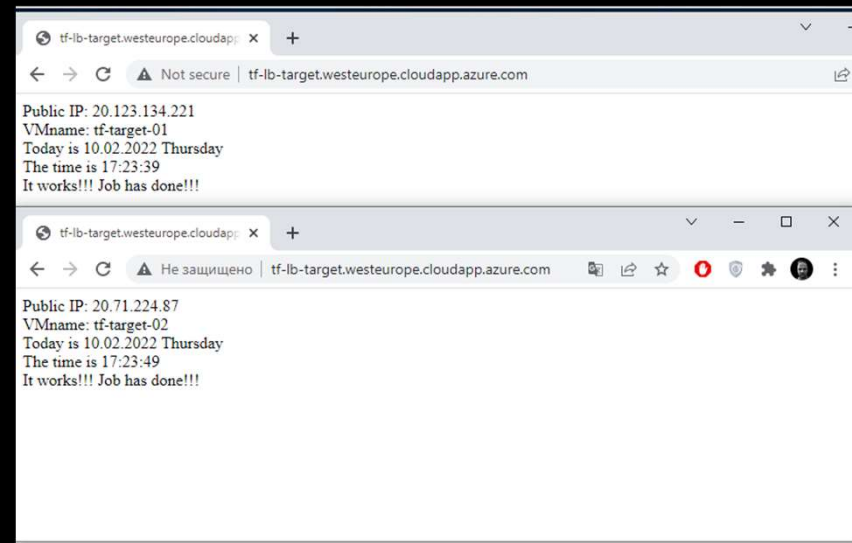
The screenshot shows the Jenkins build result page for 'index_updater' job, Build #1, dated Feb 10, 2022, at 3:19:31 PM. The build status is 'Success' (green checkmark).
- **Left sidebar:** Contains links for 'Back to Project', 'Status', 'Changes', 'Console Output', 'Edit Build Information', 'Delete build #1', 'Polling Log', and 'Git Build Data'.
- **Main content area:** Shows 'No changes' and 'Started by GitHub push by ptk2006'. It lists the revision 'e4c2118d8477cbea675115a87c8105b6d3a94c18' and the repository 'git@github.com:ptk2006/DevOps_final_project_2021Q4.git'. A 'git' icon indicates the build was triggered by a push to 'refs/remotes/origin/master'.
- **Bottom right:** Features a 'Chuck Norris' plugin notification with a thumbs-up icon and the text 'Chuck Norris knows the last digit of Pi.'.
- **Footer:** Shows 'REST API' and 'Jenkins 2.334'.

Demonstration - Results

GitHub Hook log



Changes on web pages
Add new string:
“It works!!! Job has done!!!”



Thanks everyone!