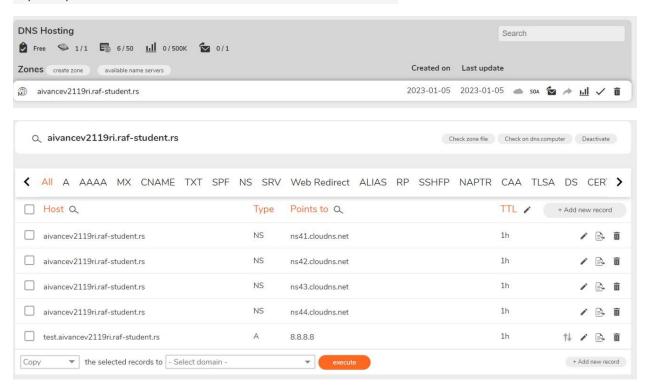
## VIRTUELIZOVANI MREŽNI SISTEMI – PROJEKAT

Prvi korak je napraviti zonu na besplatnom DNS hosting provajderu gde se hostuje taj poddomen.

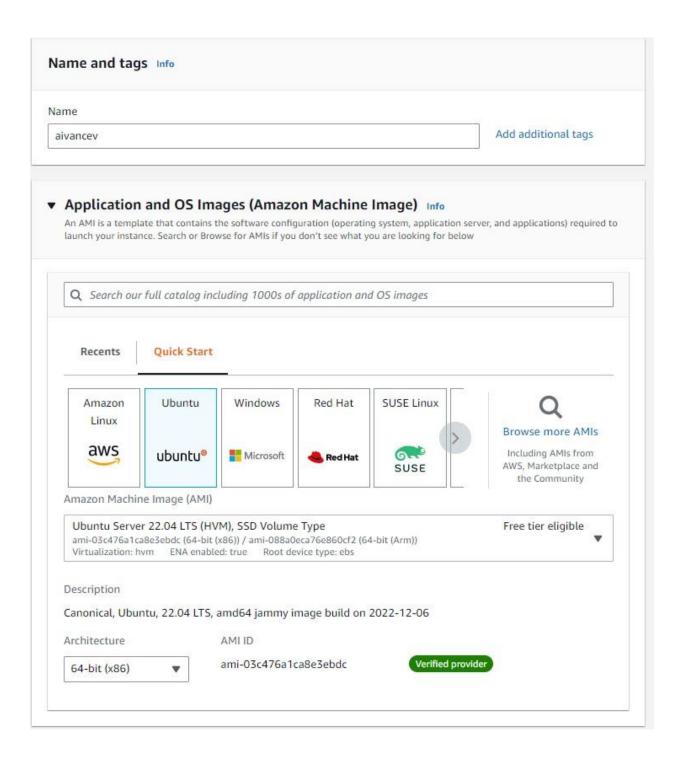
Treba odabrati Master zona - da taj server bude glavni za taj DNS.

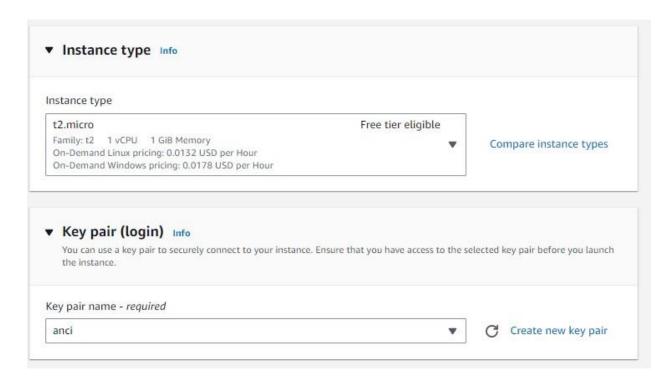
Od ponuđenih DNS servisa, treba izabrati jedan i njega povezati sa studentskim poddomenom tako sto unesemo u user.raf.edu.rs u formi kreiranje domena tu adresu (ns41.cloudns.net) i time kreiramo NS zapis ili pointer na aivancev2119ri.raf-students.rs domenu.



Zatim, kreirati nalog na AWS.

Napraviti Amazon EC2 instancu.



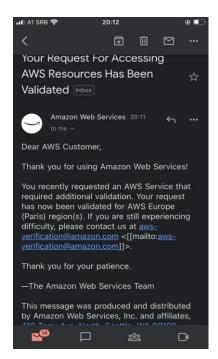


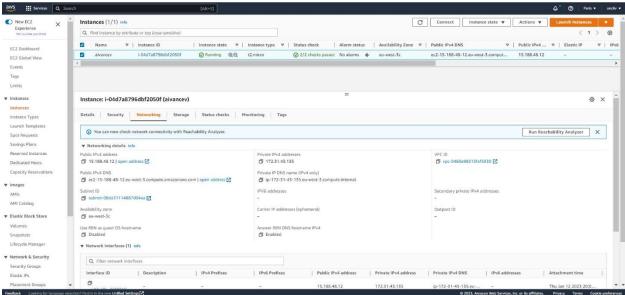
Da bismo zastitili instancu, pravimo key pair koji sadrzi privatni i javni kljuc.

Izabrati RSA i ppk da bismo se ssh-ovali preko putty-a u windowsu.



Za Network Settings i Configure Storage ostaviti defaultna podešavanja.





Uspešno kreirana instanca na AWS Cloud-u.

Zatim, pristupiti instanci preko putty-a.

Host Name: ubuntu@ec2-15-188-48-12.eu-west-3.compute.amazonaws.com

Port: 22

SSH/Authentication/anci.ppk

Sačuvati sesiju.

Instaliranje Apache Web Servera na Ubuntu 22.04

Apache je dostupan u okviru Ubuntu-ovih podrazumevanih softverskih depoa, što omogućava njegovu instalaciju pomoću konvencionalnih alatki za upravljanje paketima.

Počnite ažuriranjem indeksa lokalnog paketa tako što ćete odražavati najnovije uzvodne promene:

\$ sudo apt update

\$ sudo apt install apache2

Pre testiranja Apača, neophodno je izmeniti postavke zaštitnog zida da biste dozvolili pristup podrazumevanim Veb portovima spolja.

\$ sudo ufw app list

\$ sudo ufw allow 'Apache'

Izlaz će obezbediti listu dozvoljenih HTTP saobraćaja:

То	Action	From
Apache	ALLOW	Anywhere
OpenSSH	ALLOW	Anywhere
Apache Full	ALLOW	Anywhere
Apache (v6)	ALLOW	Anywhere (v6)
OpenSSH (v6)	ALLOW	Anywhere (v6)
Apache Full (v6)	ALLOW	Anywhere (v6)

Na kraju procesa instalacije, Ubuntu 22.04 pokreće Apache. Web server će već biti pokrenut.

Uverite se da je usluga aktivna pokretanjem komande za sistemski init sistem:

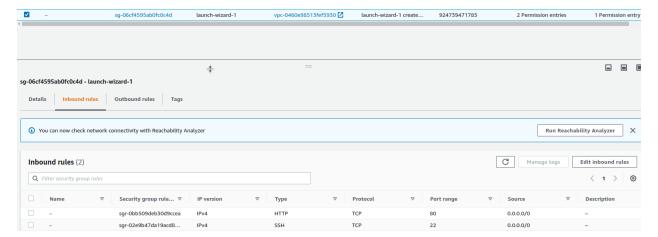
```
Verite se da je usiuga aktivna pokretanjem komidnue za si
intuganaivancev:-$ sudo systemctl status apache2
apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese
Active: active (running) since Fri 2023-01-13 17:55:59 UTC; lh 55min ago
Docs: https://httpd.apache.org/docs/2.4/
Main FID: 10557 (apache2)
Tasks: 12 (limit: 1143)
Memory: 46.2M
CFU: 816ms
CGroup: /system.slice/apache2.service
- 10558 /usr/sbin/apache2 - k start
- 10559 /usr/sbin/apache2 - k start
- 10559 /usr/sbin/apache2 - k start
- 10561 /usr/sbin/apache2 - k start
- 11435 /usr/sbin/apache2 - k start
- 11436 /usr/sbin/apache2 - k start
- 11437 /usr/sbin/apache2 - k start
- 11438 /usr/sbin/apache2 - k start
- 11438 /usr/sbin/apache2 - k start
- 11438 /usr/sbin/apache2 - k start
- 11439 /usr/sbin/apache2 - k start
- 11430 /usr/sbin/apache2 - k start
- 11440 /usr/sbin/apache2 - k start
- 11440 /usr/sbin/apache2 - k start
Jan 13 17:55:59 jp-172-31-43-135 systemd[1]: This usually indicates unclean termines 1-28...shipping...

apache2.service - The Apache HTTF Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
Active: active (running) since Fri 2023-01-13 17:55:59 UTC; 1h 55min ago
Docs: https://httpd.apache.org/docs/2.4/
Main FID: 10557 (apache2)
Tasks: 12 (limit: 1143)
Memory: 46.2M
CPU: 816ms
CGroup: /system.slice/apache2.service
-10557 /usr/sbin/apache2 -k start
-10558 /usr/sbin/apache2 -k start
-10559 /usr/sbin/apache2 -k start
-10560 /usr/sbin/apache2 -k start
-10561 /usr/sbin/apache2 -k start
-10561 /usr/sbin/apache2 -k start
-10561 /usr/sbin/apache2 -k start
-10561 /usr/sbin/apache2 -k start
            an 13 17:55:59 ip-172-31-43-135 systemd[1]: This usually indicates unclean ter>
                                                                                   -10560 /usr/sbin/apache2 -k start
-10561 /usr/sbin/apache2 -k start
-11433 /usr/sbin/apache2 -k start
-11435 /usr/sbin/apache2 -k start
-11436 /usr/sbin/apache2 -k start
-11437 /usr/sbin/apache2 -k start
-11438 /usr/sbin/apache2 -k start
                                                                                        -11439 /usr/sbin/apache2 -k start
                                       17:55:59 ip-172-31-43-135 systemd[1]: This usually indicates unclean termination of a previous run, or service implementation deficiencies 17:55:59 ip-172-31-43-135 systemd[1]: Starting The Apache HTTP Server...
17:55:59 ip-172-31-43-135 systemd[1]: Started The Apache HTTP Server.
```

Da li Apache slusa na default portu 80, moze se proveriti netstat komandom:

```
ubuntu@anaivancev:~$ netstat -anlp | grep 80
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
tcp6
                                             :::*
                                                                     LISTEN
```

Ako je web server startovan, da bi se pristupilo masini, potrebno je omoguciti pristup portu 80 u security grupe same instance:



Ovde se vidi da je ovoj instanci moguce pristupiti putem ssh-a preko njegovog default porta 22, kao i putem http-a preko default porta na kome slusa apache web server, a to je port 80.



Sam proces instalacije Maria DB verzije MySQL servera započinje unošenjem u terminal komande:

\$ sudo apt-get install mariadb-server

Vezu sa My SQL serverom možemo testirati, unošenjem u terminal komande: sudo mysgl

```
ubuntu@anaivancev:~$ sudo mysql
Welcome to the MariaDB monitor. Commands end with; or \q.
Your MariaDB connection id is 11
Server version: 10.6.11-MariaDB-Oubuntu0.22.04.1 Ubuntu 22.04
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
MariaDB [(none)] > show databases;
 Database
 information schema |
 mysql
 performance schema
 sys
4 rows in set (0.001 sec)
MariaDB [(none)]> quit;
Bye
ubuntu@anaivancev:~$
```

Inicijalna zaštita i konfiguracija se vrši unošenjem u terminal komande: sudo mysql\_secure\_installation

Pristup MySQL serveru, korišćenjem novih parametara za pristup, može se testirati sledećom komandom:

```
ubuntu@anaivancev:~$ sudo mysql -u root -h localhost -p
Enter password:
Welcome to the MariaDB monitor. Commands end with; or \g.
Your MariaDB connection id is 12
Server version: 10.6.11-MariaDB-Oubuntu0.22.04.1 Ubuntu 22.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

Uverite se da je usluga aktivna pokretanjem komande za sistemski init sistem:

```
montidesaisencevi-G ends systemoil status gyngi
mariadh.servics - Mariami Di-(-11 databas marver
Loaded: loaded (/lik/systemoi/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/systemos/sy
```

Ako je mysql startovan, da bi se pristupilo masini, potrebno je omoguciti pristup portu 3360 u security grupe same instance:



Sledeći korak je instalacija i konfiguracija PHP interpretera. Za instalaciju PHP interpretera i drugih PHP dodataka, u terminal se unose sledeće komande:

\$ sudo apt-get install php-fpm php-mysql php-common

\$ sudo apt-get install php-gd php-json php-cli

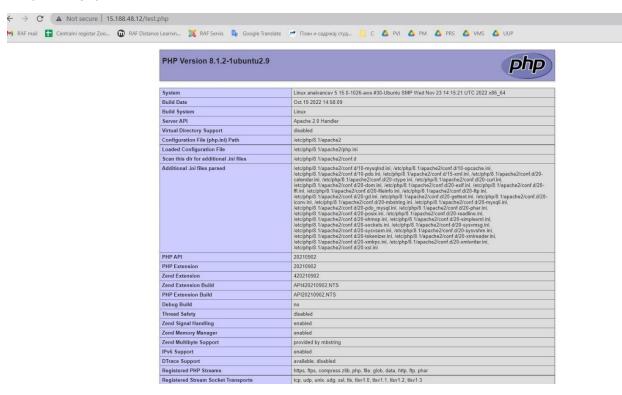
\$ sudo apt-get install php-curl libapache2-mod-php

Pre daljih aktivnosti neophodno je izvršiti testiranje, odnosno proveru da li PHP interpreter radi kako treba kroz Apache Web server. Zato je neophodno kreirati probnu PHP skriptu, čiji je zadatak da izvši PHP kod i prikaže opšte podatke o PHP interpreteru. U tu svrhu, unutar foldera kojeg opslužuje Apache Web server, potrebno je kreirati test.php fajl, unošenjem u terminal komande:

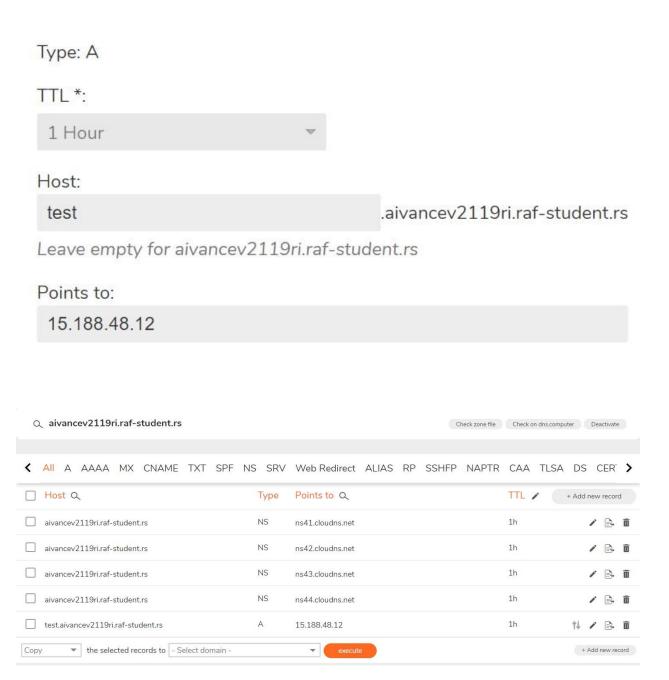
\$ sudo nano /var/www/html/test.php

Kroz nano editor je potrebno uneti probni PHP kod <?php phpinfo(); ?>, sačuvati promene i izaći iz editora.

Neophodno je proveriti da li se kreirana PHP stranica može otvoriti.



Na cloudns.net je potrebno povezati studentski poddomen sa javnom adresom aws instance.



Pristupa se konfiguraciji phpmyadmin MySQL klijenta. Njegova instalacija se započinje unošenjem u terminal komande:

\$ sudo apt install phpMyAdmin

Kada se završi instalacija phpmyadmin alata, poželjno je restartovati Apache server sa komandom:

\$ sudo systemctl restart apache2

Otvaranjem adrese http://test.aivancev2119ri.raf-student.rs/phpmyadmin/ u web pretraživaču, sada se može pristupiti phpmyadmin veb aplikaciji, odnosno MySQL klijentu



Pristup phpMyAdmin servisu preko poddomena hostovanog na AWS cloud-u

Instalacija SAMBA file sharing-a

Započnite ažuriranjem registra paketa komandom:

\$ sudo apt update

Zatim koristite apt da instalirate Sambu. Uključite argument -y da biste automatski odobrili sve upite tokom instalacije:

\$ sudo apt install samba -y

Proverite instalaciju pomoću komande:

```
ubuntu@anaivancev:~$ whereis samba
samba: /usr/sbin/samba /usr/lib/x86_64-linux-gnu/samba /etc/samba /usr/share/sam
ba /usr/share/man/man8/samba.8.gz /usr/share/man/man7/samba.7.gz
ubuntu@anaivancev:~$
```

Na kraju, potvrdite da Samba radi sa komandom:

```
ubuntu@anaivancevi-7 sudo systemctl status smbd

smbl.service - Samha SMB Daemon

solvervice - Samha SMB Daemon

place small smbd ()

man: smbd ()

man: smbd ()

man: smbc.conf(5)

Process: 13864 ExecEtatPre='usr/share/samba/update-apparmor-samba-profile

Main PTD: 13993 (smbd)

Status: *smbd: ready to serve connections..."

Tasks: 4 (limit: 1143)

Memory: 13.4M

CUU: 134ms

CGroup: /system.slice/smbd.service

- 13997 /usr/sbin/smbd - foreground --no-process-group

- 13997 /usr/lib/x86_64-linux-gnu/samba/samba-bggd --ready-signal-

Jan 13 20:22:44 anaivancev update-apparmor-samba-profile[13890]: diff: /etc/app2

Jan 13 20:23:45 anaivancev update-apparmor-samba-profile[13990]: diff: /etc/app2

Jan 13 20:23:45 anaivancev update-apparmor-samba-profile[13990]: diff: /etc/app2

Jan 13 20:23:45 anaivancev update-apparmor-samba-profile[1390]: diff: /etc/apparmor-d/samba/smbd-shares: No such file or directory

Jan 13 20:23:45 anaivancev update-apparmor-samba-profile[1390]: diff: /etc/apparmor.d/samba/smbd-shares: No such file or directory

Jan 13 20:23:45 anaivancev update-apparmor-samba-profile[1390]: diff: /etc/apparmor.d/samba/smbd-shares: No such file or directory

Jan 13 20:23:45 anaivancev update-a
```