

## Datortīklu administrēšana, 1. laboratorijas darbs

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### Servera sagatavošana darbam

New\_Server\_Lab [Running] - Oracle VM VirtualBox

Profile setup [ Help ]

Enter the username and password you will use to log in to the system. You can configure SSH access on the next screen but a password is still needed for sudo.

Jūsu vārds:

Your server's name:   
The name it uses when it talks to other computers.

Izvēlieties lietotājvārdu:

Izvēlieties paroli:

Apstipriniet paroli:

[ Gatavs ]

---

New\_Server\_Lab [Running] - Oracle VM VirtualBox

SSH Setup [ Help ]

You can choose to install the OpenSSH server package to enable secure remote access to your server.

☒ Install OpenSSH server

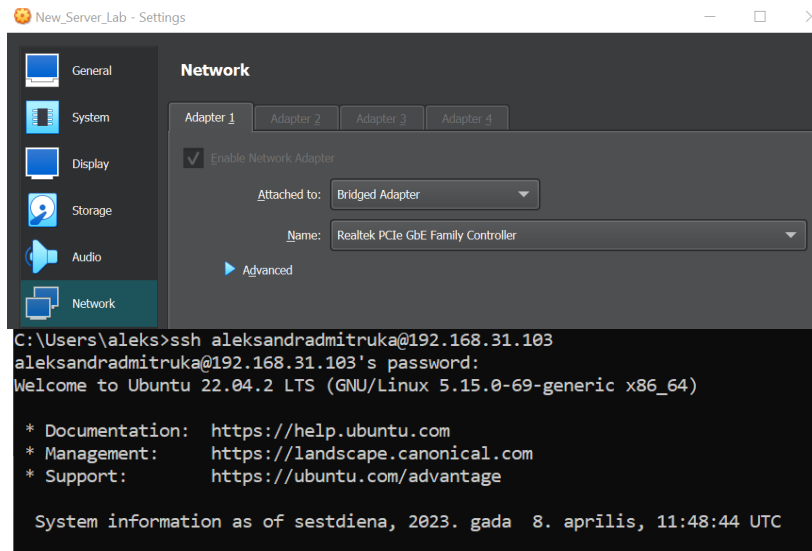
Import SSH identity: [ NE ▼ ]  
You can import your SSH keys from GitHub or Launchpad.

Import Username:

☒ Allow password authentication over SSH

[ Gatavs ]  
[ Atpakaļ ]

Jauna servera instalācijas brīdis, ievadam savu vārdu kā lietotājvārdu, uzreiz instalējam OpenSSH



Sledzamies serverim caur ssh, izmantojot windows konsoli, lai mums būtu ertāk strādāt ar serveri. Iepriekš “atļavam” serverim iegūt ip adresi mūsu lokālajā tīklā, nomainot virtuālas mašīnas tīkla iestatījumus uz “bridge adapter” un izvēloties tīkla karti, kas ir pieslegta lokālajām tīklam

```
Last login: Sat Apr 8 11:47:02 2023
aleksandrmitruka@goodserver:~$ sudo apt update
[sudo] password for aleksandrmitruka:
Hit:1 http://lv.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://lv.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://lv.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://lv.archive.ubuntu.com/ubuntu jammy-security InRelease
Get:5 http://lv.archive.ubuntu.com/ubuntu jammy/restricted Translation-lv [292 B]
Fetched 292 B in 1s (206 B/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
28 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

```
aleksandrmitruka@goodserver:~$ sudo apt dist-upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages will be upgraded:
  apparmor bind9-dnsutils bind9-host bind9-libs cloud-init distro-info-data isc-dhcp-client isc-dhcp-common
  libapparmor1 libldap-2.5-0 libldap-common libmbim-glib4 libmbim-proxy libmm-glib0 libnetplan0 libqmi-glib5
  libqmi-proxy libsass1-2 libsass1-modules libsass1-modules-db modemmanager netplan.io python3-software-properties
  software-properties-common systemd-hwe-hwdb tcpdump ubuntu-advantage-tools update-notifier-common
28 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Need to get 6 673 kB of archives.
After this operation, 1 257 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Pirms programmatūras instalēšanas obligāti atjauninām operētājsistēmu, iegūstot informāciju par jaunām pakotnēm ar apt update.

## HTTP pakalpojums (30%)

Parametrs	Vērtība
HTTP piekļuves URL	<a href="http://192.168.31.103/">http://192.168.31.103/</a> ( <a href="http://goodserver/">http://goodserver/</a> - pēc izmaiņām etc\hosts)
HTTPS piekļuves URL	<a href="https://192.168.31.103/">https://192.168.31.103/</a> ( <a href="https://goodserver/">https://goodserver/</a> - pēc izmaiņām etc\hosts)
Pakalpojuma pakotne un versija	apache2, 2.4.52-1ubuntu4.4
Vietņu mape un pieejamā diska vieta	/var/www/html/ (pēc noklusējuma) 4.3 GB

```
aleksandrmitruka@goodserver:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils bzip2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
  liblua5.3-0 mailcap mime-support ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser bzip2-doc
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils bzip2 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap
  liblua5.3-0 mailcap mime-support ssl-cert
0 upgraded, 13 newly installed, 0 to remove and 0 not upgraded.
Need to get 2 138 kB of archives.
```

Laī nodrošinātu datu pieejamību izmantojot HTTP/s protokolu/s mums vispirms ir jāinstalē Apache web serveris

```
aleksandrmitruka@goodserver:~$ sudo service apache2 status
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-04-08 11:53:08 UTC; 48s ago
     Docs: https://httpd.apache.org/docs/2.4/
  Main PID: 3162 (apache2)
    Tasks: 55 (limit: 997)
   Memory: 5.0M
      CPU: 51ms
   CGroup: /system.slice/apache2.service
           └─3162 /usr/sbin/apache2 -k start
             └─3164 /usr/sbin/apache2 -k start
               └─3165 /usr/sbin/apache2 -k start
```

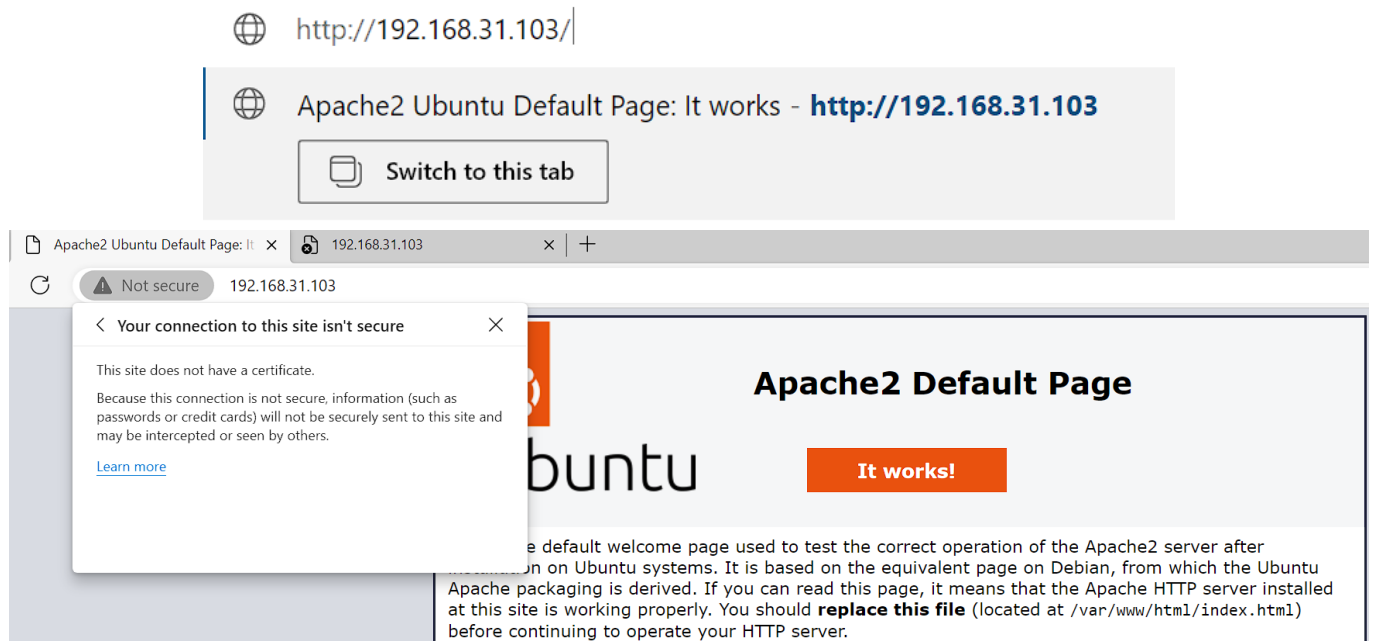
Pārliecināties, ka instalācijas process tieš'am bija veiksmīgs, un Apache serveris ir aktīvs



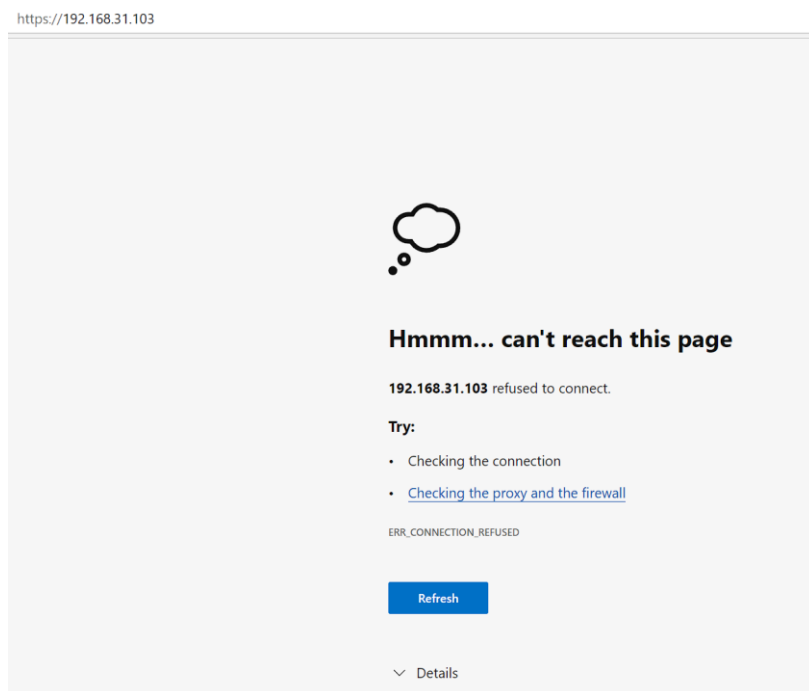
Arī par to varam pārliecināties, ierakstot mūsu ip adresi pārlūkprogrammā.

```
aleksandr@mitruka@goodserver:~$ dpkg -s apache2
Package: apache2
Status: install ok installed
Priority: optional
Section: httpd
Installed-Size: 533
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Architecture: amd64
Version: 2.4.52-1ubuntu4.4
Replaces: apache2.2-bin, apache2.2-common
```

Pārbaudām Apache2 pakotnes versiju ar debiāna pakotnes menedžera palīdzību(komandu dpkg)



Varam ieraudzīt, ka uz šo brīdi mums ir noklusēta lapa ar http pieslēgumu, bez sertifikāta



Pieklūve ar https uz šo brīdi nav iespējama

```

aleksandr@mitruka@goodserver:~$ sudo a2enmod ssl
Considering dependency setenvif for ssl:
Module setenvif already enabled
Considering dependency mime for ssl:
Module mime already enabled
Considering dependency socache_shmcb for ssl:
Enabling module socache_shmcb.
Enabling module ssl.
See /usr/share/doc/apache2/README.Debian.gz on how to configure SSL and create self-signed certificates.
To activate the new configuration, you need to run:
  systemctl restart apache2
aleksandr@mitruka@goodserver:~$ sudo a2ensite default-ssl
Enabling site default-ssl.
To activate the new configuration, you need to run:
  systemctl reload apache2
aleksandr@mitruka@goodserver:~$ sudo systemctl restart apache2
aleksandr@mitruka@goodserver:~$ cat /etc/ssl/certs/ssl-cert-snakeoil.pem
-----BEGIN CERTIFICATE-----
MIIC+CCAeOgAwIBAgIUcWekFm+r1Sr7VWpruPRv+nextkMQwDQYJKoZIhvcNAQEL
BQAwFETETMBEGA1UEAwkZMjZvZHN1cnZlcjAeFw0yMzA0MDcxNzQ0MzFaFw0zMDA0
MDQxNzQ0MzFaMBUxEzARBGMCMmdvb2RzZXJ2ZXIwggEiMA0GCSqGSIb3DQEB
AQUAA4IBDwAwggEKAAoIBAQQDjV/RAomcLAR6v9w9MfqEXRkvoI/H9WikkjTTj6UAb
tc+3ebNOJY+Upp0VsD1hwmJkLzIUdSV5ufNFCq2fyoIJ81Riu8Rn2dQTfUeb67Ao
P0UQqv7XOEhaAoghuN1QS7aE7h2bgZ1Y5EQyG7d/GjEwcXF1RjgRMzjU30fdFHHj
v+Iq9Q+LDH44u6RePb/O1MW8W6i5WrErZAhAKMzywG7g+CistOtZ54aXTnd1E1m1
2HuYNlprIYJS3jBr1m28gB+di6Qfc488K9wchShwwGh+2gvhC815HHXXrIawKD9/
aehPIQFWXDEKPa1DaiR2Zh81fw5XL5AOMKp9n8pFNA19AgMBAAGjQzBBMAkGA1Ud
EwQCMAAwFQYDVR0RBAwDIIKZ2ZvZHN1cnZlcjAdBgNVHQ4EFgQUUpZr/WLmM7uPF
NYTL2tDpmcJXdewwDQYJKoZIhvcNAQELBQADggEBAIf6KA65/HcyKS3ub9itXmTP
ZUg+zY8234EzAQSNkwk8ES/quf04or1huDFpDvytyp7Q6eaJ7C1xeJdmwEYM9H3N
o093g5oFajnm0td6f+X9fztioKtuavB02FNTgu8dX7jryfp0YXdNFE7En0zit9m2
prsAoDV4SS0xpetI5Xbcq+yS9wiWa6EU8MTBJe9P9PTuuGE2f+SK2hmLPEwjm4R
6hxiqLkPAYKe/OiAz5gK6kmauAJIQna7EYnZE/dNPYVmqHp2XkjmLelmvmjX7Kk
RLdI0mfJ8IrtqfJgb8M87SqBhmTaqQYPq1BIuWKEBkhiHt3pJ18gVcbL9F9zcSS=
-----END CERTIFICATE-----
aleksandr@mitruka@goodserver:~$ sudo cat /etc/ssl/private/ssl-cert-snakeoil.key
-----BEGIN PRIVATE KEY-----
MIIEvgIBADANBgkqhkiG9w0BAQEFAASCBAwggSkAgEAAoIBAQQDjV/RAomcLAR6v
9w9MfqEXRkvoI/H9WikkjTTj6UAbtc+3ebNOJY+Upp0VsD1hwmJkLzIUdSV5ufN
FCq2fyoIJ81Riu8Rn2dQTfUeb67AoP0UQqv7XOEhaAoghuN1QS7aE7h2bgZ1Y5EQy
G7d/GjEwcXF1RjgRMzjU30fdFHHjv+Iq9Q+LDH44u6RePb/O1MW8W6i5WrErZAhA
KMzywG7g+CistOtZ54aXTnd1E1m12HuYNlprIYJS3jBr1m28gB+di6Qfc488K9w
chShwwGh+2gvhC815HHXXrIawKD9/aehPIQFWXDEKPa1DaiR2Zh81fw5XL5AOMKp9
n8pFNA19AgMBAAGCggEAAIA/G5BiJNJOXWtSaZTzUhh4KqmXrWkINXFjHtT6valkF
Lshsh6BXc+zdaXIdXZKw4q8fPmHo6qZVTw7W9ppQJU4aQARgCg9Xz9nSsAQYp0xo
ppV09FY9KeiCf1L9bzYGSw/zv/sTEDa9AV4UTkoI1t6g0doJzS8unCLFTfQuWE6z

```

Iesledzam apache ssl moduli, kas nodrošina datu šifrešanu(https), pārbaudam noklusētu ssl (snakeoil) sertifikātu un atslēgu

```

aleksandr@mitruka@goodserver: ~
GNU nano 6.2 /etc/apache2/sites-available/000-default.conf
<VirtualHost *:80>
# The ServerName directive sets the request scheme, hostname and port that
# the server uses to identify itself. This is used when creating
# redirection URLs. In the context of virtual hosts, the ServerName
# specifies what hostname must appear in the request's Host: header to
# match this virtual host. For the default virtual host (this file) this
# value is not decisive as it is used as a last resort host regardless.
# However, you must set it for any further virtual host explicitly.
#ServerName www.example.com

ServerAdmin webmaster@localhost
DocumentRoot /var/www/html

# Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
# error, crit, alert, emerg.
# It is also possible to configure the loglevel for particular
# modules, e.g.
#LogLevel info ssl:warn

ErrorLog ${APACHE_LOG_DIR}/error.log
CustomLog ${APACHE_LOG_DIR}/access.log combined

# For most configuration files from conf-available/, which are
# enabled or disabled at a global level, it is possible to
# include a line for only one particular virtual host. For example the
# following line enables the CGI configuration for this host only
# after it has been globally disabled with "a2disconf".
#Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet

```

Kā var redzēt, apache izveido noklusēto virtuālo hostu, kurš arī atbild par sāukmlapu. To nerediģejam.

```

GNU nano 6.2 /etc/apache2/sites-available/default-ssl.conf
<IfModule mod_ssl.c>
<VirtualHost _default_:443>
    ServerAdmin webmaster@localhost

    DocumentRoot /var/www/html

    # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
    # error, crit, alert, emerg.
    # It is also possible to configure the loglevel for particular
    # modules, e.g.
    #LogLevel info ssl:warn

    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf

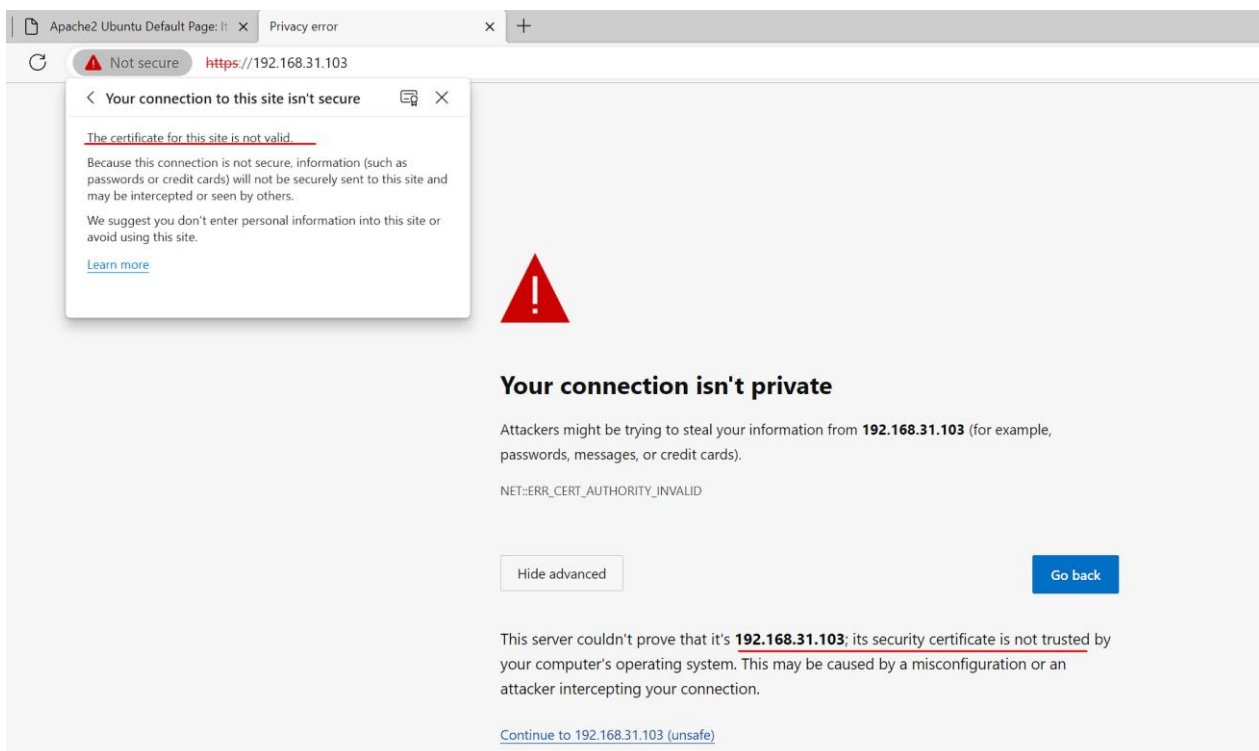
    # SSL Engine Switch:
    # Enable/Disable SSL for this virtual host.
    SSLEngine on

    # A self-signed (snakeoil) certificate can be created by installing
    # the ssl-cert package. See
    # /usr/share/doc/apache2/README.Debian.gz for more info.
    # If both key and certificate are stored in the same file, only the
    # SSLCertificateFile directive is needed.
    SSLCertificateFile /etc/ssl/certs/ssl-cert-snakeoil.pem
    SSLCertificateKeyFile /etc/ssl/private/ssl-cert-snakeoil.key

    # Server Certificate Chain:
    # Point SSLCertificateChainFile at a file containing the
    # concatenation of PEM encoded CA certificates which form the
    # certificate chain for the server certificate. Alternatively
    # the referenced file can be the same as SSLCertificateFile
    # when the CA certificates are directly appended to the server
    # certificate for convinience.
    #SSLCertificateChainFile /etc/apache2/ssl.crt/server-ca.crt

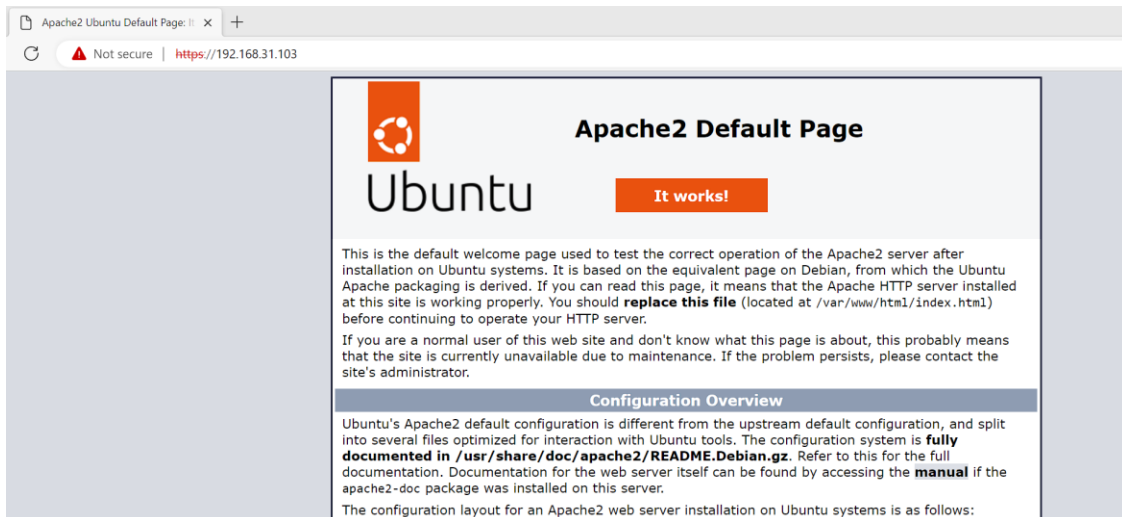
```

Tomēr noklusētais ssl-fails satur minimālo nepieciešamo informāciju, lai ieslegu https noklusētajam apache2 hostam(īr informāciju par snakeoil atslēgu, sertifikātu, ssl dziņa ieslēgumu norādīta direktorija var/www/html, kur atrodas mājaslapa). Tāpēc, iesledzot ssl un noklusēto ssl konfigurāciju, mēs jau panākam, ka mums ir https priekš noklusēta hosta(mājaslapas)

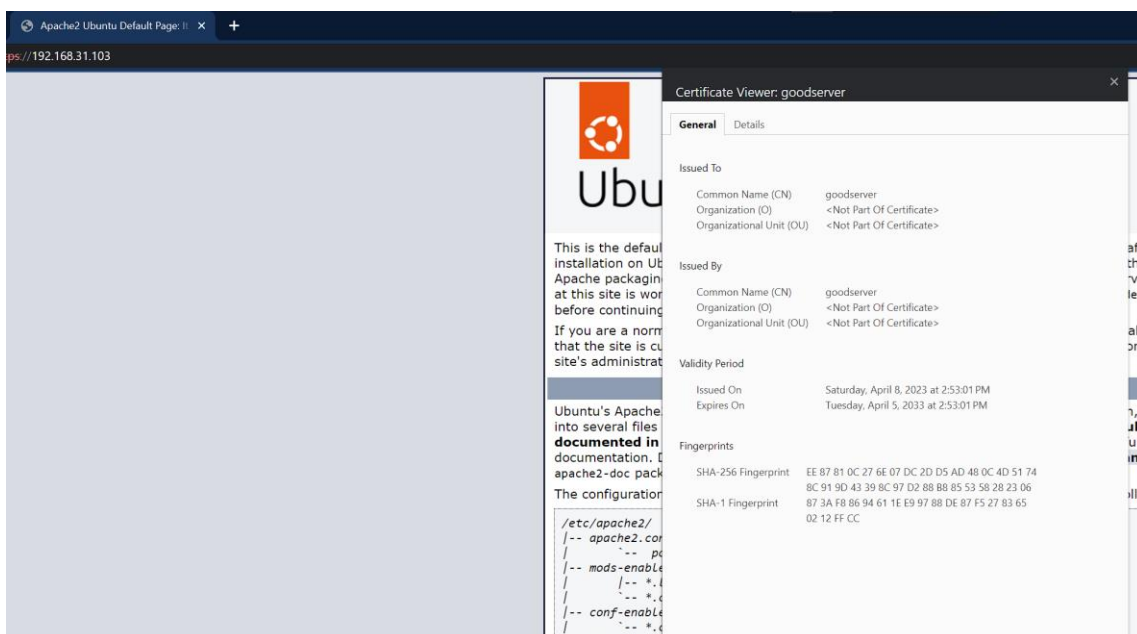


Pārbaudam to. Paradas informācija, ka sertifikāts eksistē, tomēr tas nav uzticams. To varam ignorēt, jo zinām, ka sertifikāts nav "īstais"(piem., kā letsencrypt, kuru iegūt nevaram, jo mājas darbu veicam ar lokālo adresi, nekur neregēstrējot savu domēnu), bet sākotnējais (pašģenerētais), un spiežam "continue"

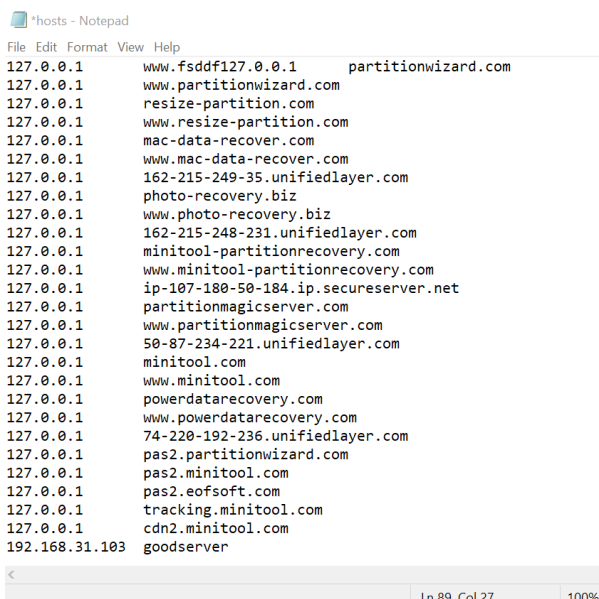




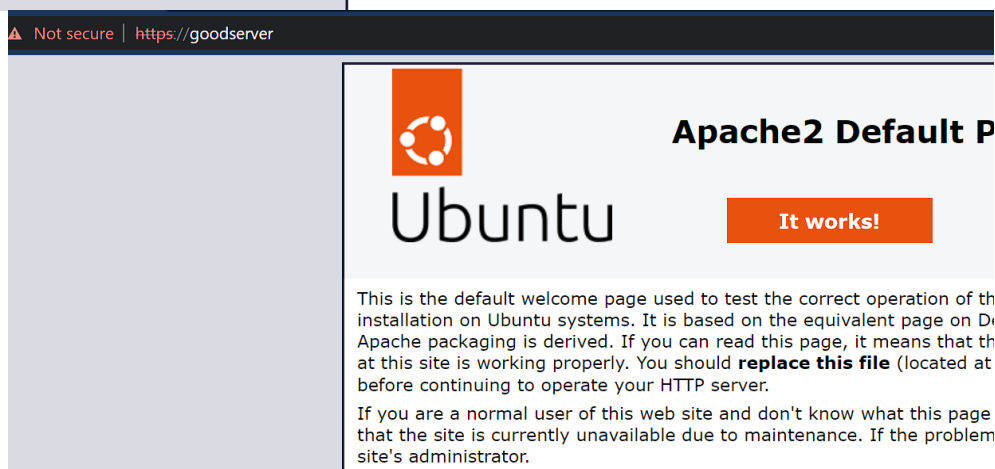
Redzam, ka tagad mājaslapa ar https pieslēgumu eksistē!



Varam arī apskatīt mūsu sākotnēja sertifikāta detaļas



Ja tomēr gribam īsāku url, tad varam norādīt servera vārdu \\Windows\\System32\\drivers\\etc\\hosts



Tagad varam tam piekļūt ar <http://goodserver/> un <https://goodserver/>

```
aleksandrmitruka@goodserver:~$ df -h /
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/ubun 8,1G  3,4G  4,3G  44% /
```

Uzzinam pieejamo diska vietu



## MySQL pakalpojums (10%)

Parametrs	Vērtība
Servera adrese	127.0.0.1
Pakalpojuma pakotne un versija	mysql-server, 8.0.32-0ubuntu0.22.04.2

```
aleksandrmitruka@goodserver:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7 1
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-messa
  liblwp-mediatypes-perl libmecab2 libprotobuf-lite23 libtimedate-perl liburi-perl mecab-ipadic
  mysql-client-8.0 mysql-client-core-8.0 mysql-common mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
```

Izmantojot attiecīgo komandu, instalējam MySQL pakalpojumu

```
aleksandrmitruka@goodserver:~$ netstat -ln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 127.0.0.1:33060         0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:53:53        0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:3306         0.0.0.0:*               LISTEN

aleksandrmitruka@goodserver:~$ sudo service mysql status
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-04-11 18:51:11 UTC; 2h 38min ago
     Main PID: 725 (mysqld)
    Status: "Server is operational"
       Tasks: 38 (limit: 997)
      Memory: 389.6M
         CPU: 1min 11.762s
    CGroup: /system.slice/mysql.service
            └─725 /usr/sbin/mysqld
```

Iepriekš ieinstalējot net-tools (ar `sudo apt install net-tools`) pārlicināties, ka uz 3306 porta, tas ir, MySQL porta, ir statuss “klausās”. Pēc noklusējuma servera adrese ir localhost – to arī ierakstam tabulā.

Arī varam pārbaudīt to statusu un ieraudzīt, ka tas tiešām ir aktīvs

```
aleksandrmitruka@goodserver:~$ dpkg -s mysql-server
Package: mysql-server
Status: install ok installed
Priority: optional
Section: database
Installed-Size: 35
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Architecture: all
Source: mysql-8.0
Version: 8.0.32-0ubuntu0.22.04.2
```

Pārbaudām MySQL versiju (tāda veidā arī varam pārlicināties, ka pakotne ir instalētā)

```
mysql> status
-----
mysql Ver 8.0.32-0ubuntu0.22.04.2 for Linux on x86_64 ((Ubuntu))

Connection id:          9
Current database:
Current user:           root@localhost
SSL:                    Not in use
Current pager:          stdout
Using outfile:          ''
Using delimiter:        ;
Server version:         8.0.32-0ubuntu0.22.04.2 (Ubuntu)
Protocol version:       10
Connection:             Localhost via UNIX socket
Server character set:   utf8mb4
```

Varam to arī uzprasīt tieši mysql (un pārliecināties par “connection”)

```
aleksandrmitruka@goodserver:~$ sudo mysql
[sudo] password for aleksandrmitruka:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.32-0ubuntu0.22.04.2 (Ubuntu)

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owners.

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

mysql> CREATE DATABASE blogdb;
Query OK, 1 row affected (0,05 sec)

mysql> CREATE USER 'blog'@'localhost' IDENTIFIED BY 'admin';
Query OK, 0 rows affected (0,06 sec)

mysql> GRANT ALL PRIVILEGES ON blogdb.* TO 'blog'@'localhost' WITH
-> GRANT OPTION;
Query OK, 0 rows affected (0,01 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0,01 sec)
```

Pārbaudām funkcionalitāti. Pārliecināties, ka varam izveidot jaunu datu bāzi, lietotāju, piešķirt tiesības

```
aleksandrmitruka@goodserver:~$ mysql -u blog -p blogdb
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.32-0ubuntu0.22.04.2 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> SHOW DATABASES;
+-----+
| Database |
+-----+
| blogdb   |
| information_schema |
| performance_schema |
+-----+
3 rows in set (0,00 sec)
```

Ieejam MySQL ar savu lietotājvārdu un paroli, pārbaudām, vai izveidojas jauna datu bāze. Redzam, ka tā ir

## DNS pakalpojums (30%)

Parametrs	Vērtība
Servera adrese	192.168.31.103
Publicētais domēns	pavasaris.lv.
Tīmekļa vietnes IP adrese tajā domēnā	192.168.31.103

```
aleksandrmitruka@goodserver:~$ sudo apt-get install bind9
[sudo] password for aleksandrmitruka:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bind9-utils dns-root-data
Suggested packages:
  bind-doc resolvconf
The following NEW packages will be installed:
  bind9 bind9-utils dns-root-data
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 426 kB of archives.
After this operation, 1 674 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Sākumā instalējam BIND DNS serveri

```
aleksandrmitruka@goodserver:~$ dpkg -s bind9
Package: bind9
Status: install ok installed
Priority: optional
Section: net
Installed-Size: 960
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Architecture: amd64
Version: 1:9.18.12-0ubuntu0.22.04.1

aleksandrmitruka@goodserver:~$ sudo service bind9 status
● named.service - BIND Domain Name Server
   Loaded: loaded (/lib/systemd/system/named.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-04-10 20:25:48 UTC; 6min ago
     Docs: man:named(8)
  Process: 1561 ExecStart=/usr/sbin/named $OPTIONS (code=exited, status=0/SUCCESS)
    Main PID: 1571 (named)
      Tasks: 4 (limit: 997)
     Memory: 11.7M
        CPU: 115ms
    CGroup: /system.slice/named.service
            └─1571 /usr/sbin/named -u bind

aleksandrmitruka@goodserver:~$ netstat -ln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:953           0.0.0.0:*               LISTEN
tcp        0      0 192.168.31.103:53       0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:33060         0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:3306          0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:53            0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.53:53           0.0.0.0:*               LISTEN
tcp6       0      0 :::22                   :::*                     LISTEN
tcp6       0      0 :::80                    :::*                     LISTEN
tcp6       0      0 :::1:53                  :::*                     LISTEN
```

Pārbaudām, ka BIND tiešām ir instalēts un strādā. Redzam, ka pakotnes statuss ir “instalēts”, ka arī ka pats BIND ir aktīvs, bet uz tcp6 53 porta ir statuss “klausās”

```
aleksandrmitruka@goodserver:/etc/bind$ sudo cp db.local db.pavasaris.lv
aleksandrmitruka@goodserver:/etc/bind$ sudo nano db.pavasaris.lv
```

```
GNU nano 6.2 db.pavasaris.lv
;
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA localhost. root.localhost. (
        2      ; Serial
        604800 ; Refresh
        86400  ; Retry
        2419200 ; Expire
        604800 ) ; Negative Cache TTL
;
@ IN NS localhost.
@ IN A 127.0.0.1
@ IN AAAA ::1
```

Esot iekša direktoriņā etc/bind, kopējam vienu no noklusētajam, tas ir, lokālas(localhost) zonas konfigurācijas failu failā ar mūsu domēna vārdu

```
aleksandrmitruka@goodserver: /etc/bind
GNU nano 6.2 db.pavasaris.lv *
;
; BIND data file for local loopback interface
;
$ORIGIN pavasaris.lv.
$TTL 604800
@ IN SOA ns.pavasaris.lv. admin.pavasaris.lv. (
        3      ; Serial
        604800 ; Refresh
        86400  ; Retry
        2419200 ; Expire
        604800 ) ; Negative Cache TTL
;
@ IN NS ns.pavasaris.lv.
@ IN A 192.168.31.103
ns IN A 192.168.31.103
a IN A 192.168.31.103
b IN CNAME a.pavasaris.lv.
```

Veicam nepieciešamas pārmaiņas. Norādām primāra vārda servera adresi(192.168.31.103 pie @), to vārdu(ns.pavasaris.lv), hostu(tīmekļa serveru) vārdus un adreses, ka arī ka b.pavasaris.lv ir a.pavasaris.lv sinonīms un citus nepieciešamus datus(ipv6 adresi izdzēsām, jo mums tā nav, bet ::1 ir loopback), saglabājam failu

```
aleksandrmitruka@goodserver: /etc/bind
GNU nano 6.2 /etc/bind/named.conf.local *
//
// Do any local configuration here
//

zone "pavasaris.lv" {
    type master;
    file "/etc/bind/db.pavasaris.lv";
};

// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
```

Norādām zonas failā informāciju. Ierakstām pie zone domēna vārdu, par kuru atbildes DNS servera zona, norādām, ka tas ir primārais serveris(master) un ceļu uz failu ar zonas parametriem

```

aleksandrmitruka@goodserver:~$ service bind9 restart
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ====
Authentication is required to restart 'named.service'.
Authenticating as: aleksandrmitruka
Password:
==== AUTHENTICATION COMPLETE ====
aleksandrmitruka@goodserver:~$ host a.pavasaris.lv 192.168.31.103
Using domain server:
Name: 192.168.31.103
Address: 192.168.31.103#53
Aliases:

a.pavasaris.lv has address 192.168.31.103
aleksandrmitruka@goodserver:~$ host b.pavasaris.lv 192.168.31.103
Using domain server:
Name: 192.168.31.103
Address: 192.168.31.103#53
Aliases:

b.pavasaris.lv is an alias for a.pavasaris.lv.
a.pavasaris.lv has address 192.168.31.103

```

Pārstartējam serveri un pārbaudām, vai varam iegūt informāciju par a.pavasaris.lv un t.t.

```

C:\Users\aleks>nslookup a.pavasaris.lv 192.168.31.103
Server: UnKnown
Address: 192.168.31.103

Name: a.pavasaris.lv
Address: 192.168.31.103

C:\Users\aleks>nslookup b.pavasaris.lv 192.168.31.103
Server: UnKnown
Address: 192.168.31.103

Name: a.pavasaris.lv
Address: 192.168.31.103
Aliases: b.pavasaris.lv

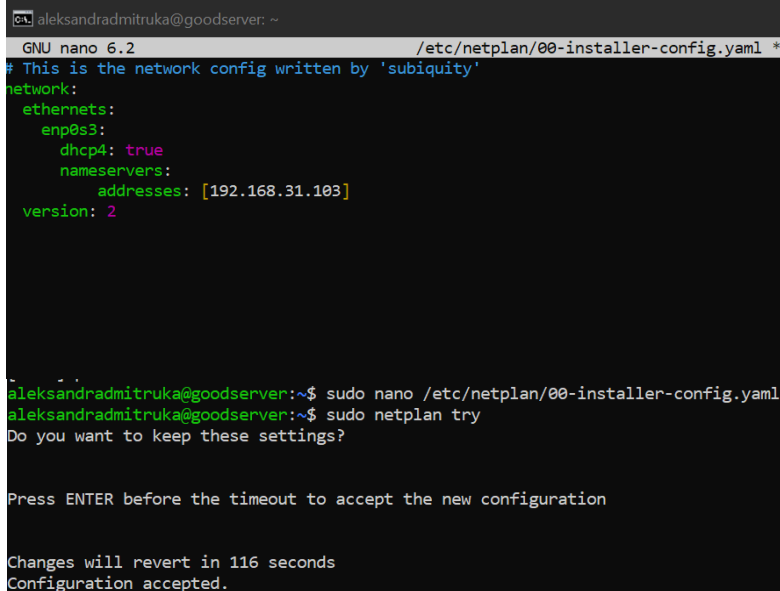
```

Pārbaudām arī ar windows konsoli, vai varam iegūt informāciju tur

```

aleksandrmitruka@goodserver:~$ host a.pavasaris.lv
Host a.pavasaris.lv not found: 3(NXDOMAIN)
aleksandrmitruka@goodserver:~$

```



```

GNU nano 6.2 /etc/netplan/00-installer-config.yaml *
# This is the network config written by 'subiquity'
network:
  ethernet:
    enp0s3:
      dhcp4: true
      nameservers:
        addresses: [192.168.31.103]
  version: 2

aleksandrmitruka@goodserver:~$ sudo nano /etc/netplan/00-installer-config.yaml
aleksandrmitruka@goodserver:~$ sudo netplan try
Do you want to keep these settings?

Press ENTER before the timeout to accept the new configuration

Changes will revert in 116 seconds
Configuration accepted.

```

Redzam, ka bez dns servera ip hostus nevaram sasniegt. Lai sasniegtu hostus bez ip adreses serverī, varam pamainīt failu 00-installer-config.yaml, ierakstot tajā jauna vārda servera adresi, tas ir, mūsu dns servera

```

aleksandrmitruka@goodserver:~$ host b.pavasaris.lv
b.pavasaris.lv is an alias for a.pavasaris.lv.
a.pavasaris.lv has address 192.168.31.103
aleksandrmitruka@goodserver:~$ host a.pavasaris.lv
a.pavasaris.lv has address 192.168.31.103
aleksandrmitruka@goodserver:~$
aleksandrmitruka@goodserver:~$ host ns.pavasaris.lv
ns.pavasaris.lv has address 192.168.31.103

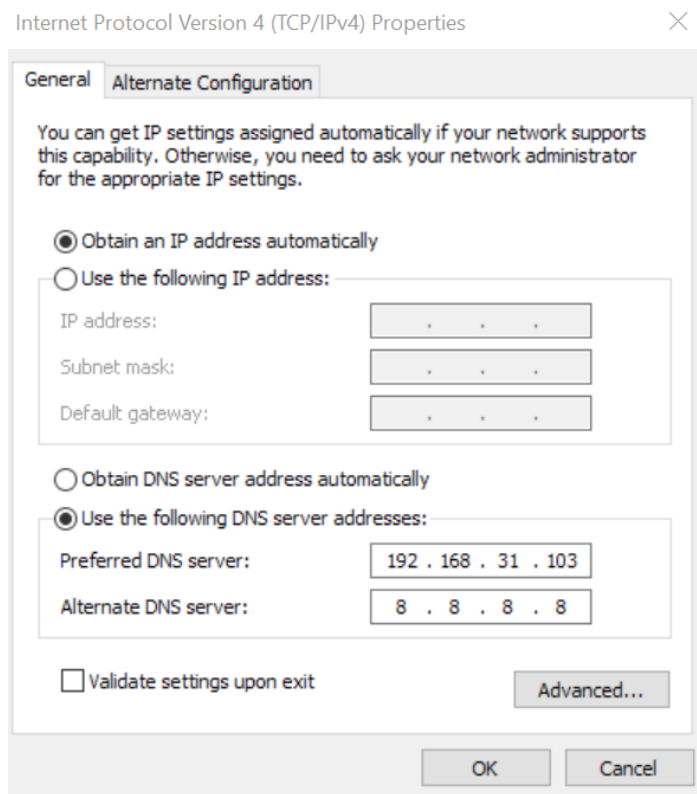
```

Tagad varam vaicāt domēna vārdus, nenoradot DNS serveri

```

C:\Users\aleks>nslookup a.pavasaris.lv
DNS request timed out.
    timeout was 2 seconds.

```



Ja gribam sasniegt līdzīgu rezultātu ārpus servera, tad varam pamainīt datora dns iestatījumus priekš ipv4

```

C:\Users\aleks>nslookup a.pavasaris.lv
Server: UnKnown
Address: 192.168.31.103

Name: a.pavasaris.lv
Address: 192.168.31.103

C:\Users\aleks>nslookup b.pavasaris.lv
Server: UnKnown
Address: 192.168.31.103

Name: a.pavasaris.lv
Address: 192.168.31.103
Aliases: b.pavasaris.lv

```

Pārbaudām un iegūstam atbildes, nenoradot servera ip

# Pirmā Timekļa vietne (15%)

Parametrs	Vērtība
Piekļuves URL	http://a.pavasaris.lv/
Vietnes mape serverī	/var/www/a.pavasaris.lv
Vietnes virsraksts	Welcome to a.pavasaris.lv
Sākuma lapas ātrdarbība	2341.1                      vaicājumi/s

```
aleksandrmitruka@goodserver:~$ sudo mkdir -p /var/www/a.pavasaris.lv
aleksandrmitruka@goodserver:~$ sudo nano /var/www/a.pavasaris.lv/index.html

GNU nano 6.2 /var/www/a.pavasaris.lv/index.html *
html>
<head>
<title>Welcome to a.pavasaris.lv</title>
</head>
<body>
<h1>Hi!This is a.pavasaris.lv, your guide to the world of easter</h1>
<h2>Are you ready to leave some easter eggs on your server? :) </h2>
<h3> Okay, well at least enjoy those cute bunnies!</h3>
<pre>

/)/)                (\(\
( . .)              (. . )
< > Hi!             Hello!< )

</pre>
</body>
</html>
```

Izveidojam jaunu direktoriju(mapi) priekš mūsu hosta a.pavasaris.lv vietņu mapē, izveidojam un rediģējam html failu

```
aleksandrmitruka@goodserver:~$ sudo cp /etc/apache2/sites-available/000-default.conf /etc/apache2/sites-available/a.pavasaris.lv.conf
[sudo] password for aleksandrmitruka:
aleksandrmitruka@goodserver:~$ sudo nano /etc/apache2/sites-available/a.pavasaris.lv.conf

GNU nano 6.2 /etc/apache2/sites-available/a.pavasaris.lv.conf *
<VirtualHost *:80>
# The ServerName directive sets the request scheme, hostname and port that
# the server uses to identify itself. This is used when creating
# redirection URLs. In the context of virtual hosts, the ServerName
# specifies what hostname must appear in the request's Host: header to
# match this virtual host. For the default virtual host (this file) this
# value is not decisive as it is used as a last resort host regardless.
# However, you must set it for any further virtual host explicitly.
#ServerName www.example.com

ServerAdmin admin@pavasaris.lv
ServerName a.pavasaris.lv
ServerAlias www.a.pavasaris.lv
DocumentRoot /var/www/a.pavasaris.lv

ErrorLog ${APACHE_LOG_DIR}/a.pavasaris.lv.error.log
CustomLog ${APACHE_LOG_DIR}/a.pavasaris.lv.access.log combined

# For most configuration files from conf-available/, which are
# enabled or disabled at a global level, it is possible to
# include a line for only one particular virtual host. For example the
# following line enables the CGI configuration for this host only
# after it has been globally disabled with "a2disconf".
#Include conf-available/serve-cgi-bin.conf
</VirtualHost>
```

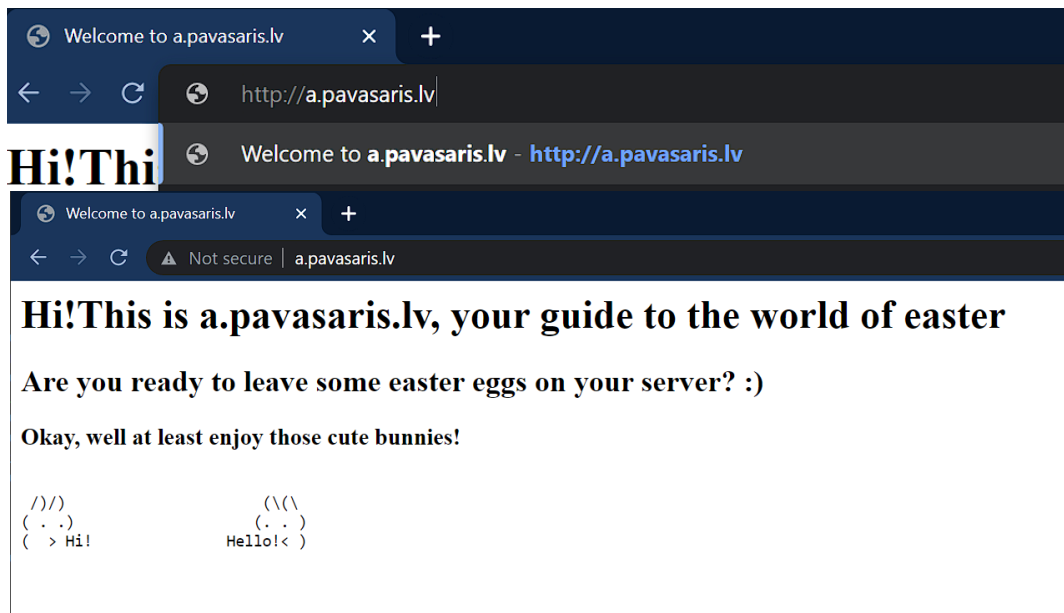
Kopējam noklusēta hosta konfigurācijas failu uz a.pavasaris.lv.conf un rediģējam atbilstoši hosta nosaukumam



```

aleksandrmitruka@goodserver:~$ sudo a2ensite a.pavasaris.lv
Enabling site a.pavasaris.lv.
To activate the new configuration, you need to run:
    systemctl reload apache2
aleksandrmitruka@goodserver:~$ sudo rm /etc/apache2/sites-available/000-default.conf
aleksandrmitruka@goodserver:~$ sudo systemctl reload apache2
aleksandrmitruka@goodserver:~$ sudo ls /etc/apache2/sites-available/
a.pavasaris.lv.conf default-ssl.conf

```



Ieslēdzam mūsu mājaslapu, izdzēsām noklusēto hostu un pārstartējam apache. Strādā, jo gan ierakstījām pareizus dns iestatījumus datorā un serverī, gan nokonfigurējām hostus

```

aleksandrmitruka@goodserver:~$ ab -n 100 -c 5 http://a.pavasaris.lv/index.html
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking a.pavasaris.lv (be patient).....done


Server Software:      Apache/2.4.52
Server Hostname:      a.pavasaris.lv
Server Port:          80

Document Path:        /index.html
Document Length:      404 bytes

Concurrency Level:    5
Time taken for tests:  0.043 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    67500 bytes
HTML transferred:     40400 bytes
Requests per second:  2341.10 [#/sec] (mean)
Time per request:     2.136 [ms] (mean)
Time per request:     0.427 [ms] (mean, across all concurrent requests)
Transfer rate:        1543.20 [Kbytes/sec] received

Connection Times (ms)
      min   mean[+/-sd] median   max
Connect:    0     0   0.3      0     2
Processing:  1     2   1.7      2    13
Waiting:    0     1   1.7      1    12
Total:      1     2   1.7      2    13

Percentage of the requests served within a certain time (ms)
 50%    2
 66%    2
 75%    2
 80%    2
 90%    3
 95%    4
 98%   13
 99%   13
100%   13 (longest request)

```

Pārbaudām sāukmlapas jeb mērķa lapas index.html ātrdarbību, simulējot 100 pieprasījumus no 5 “lietotājiem”

## Otrā Tīmekļa vietne (15%)

Parametrs	Vērtība
Piekļuves URL	http://b.pavasaris.lv/
Vietnes mape serverī	/var/www/b.pavasaris.lv
Vietnes virsraksts	Say hello to b.pavasaris.lv
Sākuma lapas ātrdarbība	2335.47      vaicājumi/s

```
aleksandradmitruka@goodserver:~$ sudo mkdir -p /var/www/b.pavasaris.lv
aleksandradmitruka@goodserver:~$ sudo nano /var/www/b.pavasaris.lv/index.html
```

```

GNU nano 6.2 /var/www/b.pavasaris.lv/index.html *
<html>
<head>
<title>Say hello to b.pavasaris.lv</title>
</head>
<body>
<h1>Hooray, b.pavasaris.lv is also alive now! Isn't that a miracle?</h1>
<h2>So, we aren't that a.pavasaris version and that's why we brought you... </h2>
<h3> LINUX PENGUIN </h3>
<pre>
      _nnnn_
    dGGGGMMb
    @p~qp~qMb | Linux Rules! |
    M|@||@| M|
    @,-----JM| -'
    JS^`\/ qKL
    dZP      qKRb
    dZP      qKKb
    fZP      SMMb
    HZM      MMMM
    Fq.      MMMM
    |  ..    | \dS"qML
    |  .     |  '  \Zq
    |  \_..._|
    |  )MMMMM|
    |  \_..._|

</pre>
</body>
</html>

```

Izveidojam jaunu direktoriju(mapi) priekš mūsu hosta b.pavasaris.lv vietņu mapē, izveidojam un rediģējam html failu

```
aleksandramitruka@goodserver:~$ sudo cp /etc/apache2/sites-available/a.pavasaris.lv.conf /etc/apache2/sites-available/b.pavasaris.lv.conf
aleksandramitruka@goodserver:~$ sudo nano /etc/apache2/sites-available/b.pavasaris.lv.conf
```

```

alexandr@kali:~/Documents$ ssh alexs@goodserver:~
GNU nano 2.9.3 /etc/apache2/sites-available/b.pavasaris.lv.conf
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

    ServerAdmin admin@pavasaris.lv
    ServerName b.pavasaris.lv
    ServerAlias www.b.pavasaris.lv
    DocumentRoot /var/www/b.pavasaris.lv

    ErrorLog ${APACHE_LOG_DIR}/b.pavasaris.lv.error.log
    CustomLog ${APACHE_LOG_DIR}/b.pavasaris.lv.access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr poet

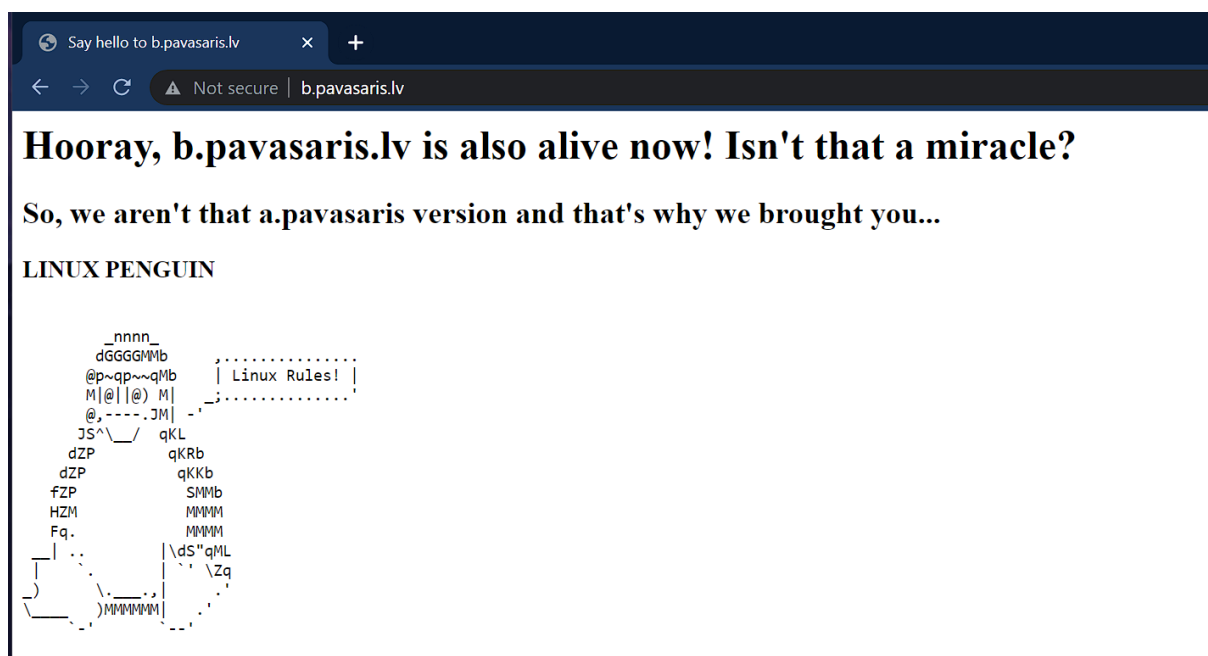
```

Tā kā noklusētais konfigurācijas fails ir izdēsts, kopējam a.pavasaris.lv konfigurācijas failu un rediģējam atbilstoši b.pavasaris.lv

```

aleksandrmitruka@goodserver:~$ sudo a2ensite b.pavasaris.lv
Enabling site b.pavasaris.lv.
To activate the new configuration, you need to run:
    systemctl reload apache2
aleksandrmitruka@goodserver:~$ sudo systemctl reload apache2

```



Ieslēdzam mūsu mājaslapu un pārstartējam apache. Strāda!

```

aleksandrmitruka@goodserver:~$ ab -n 100 -c 5 http://b.pavasaris.lv/index.html
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking b.pavasaris.lv (be patient).....done


Server Software:      Apache/2.4.52
Server Hostname:      b.pavasaris.lv
Server Port:          80

Document Path:        /index.html
Document Length:      711 bytes

Concurrency Level:    5
Time taken for tests:  0.043 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    98200 bytes
HTML transferred:     71100 bytes
Requests per second:  2335.47 [#/sec] (mean)
Time per request:      2.141 [ms] (mean)
Time per request:      0.428 [ms] (mean, across all concurrent requests)
Transfer rate:         2239.68 [Kbytes/sec] received

Connection Times (ms)
  min   mean[+/-sd] median   max
Connect:    0    0   0.3      0     2
Processing:  1    2   0.6      2     5
Waiting:    0    1   0.5      1     3
Total:      1    2   0.6      2     5

Percentage of the requests served within a certain time (ms)
 50%    2
 66%    2
 75%    2
 80%    2
 90%    3
 95%    4
 98%    4
 99%    5
100%    5 (longest request)

```

Pārbaudām sāukmlapas jeb mērķa lapas index.html ātrdarbību, simulējot 100 pieprasījumus no 5 “lietotājiem”