

A faint, light gray world map is visible in the background of the slide, centered behind the title text.

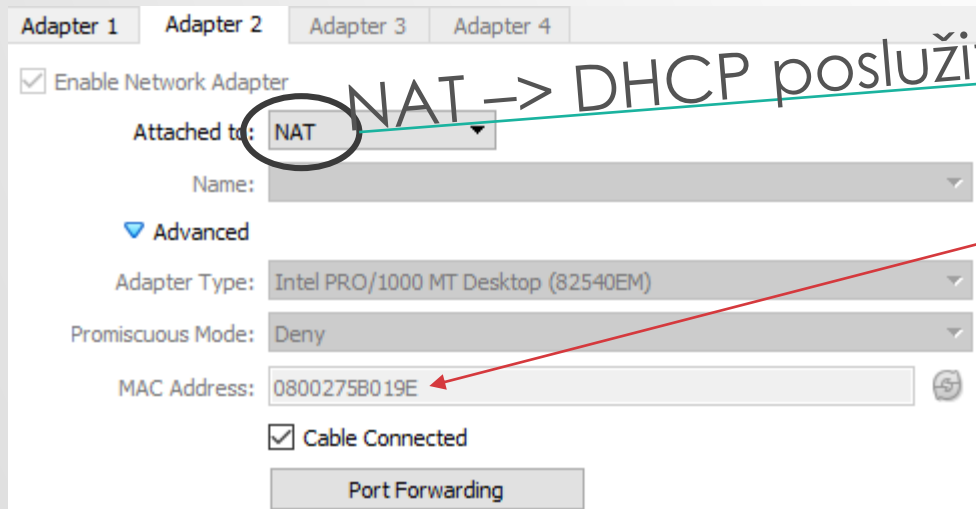
DNS POSLUŽITELJ NA LINUX OS-U

Mirko Jambrošić, mag. ing. inf. et comm. techn.

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN mode DEFAULT group default qlen 1000
   link/ether 08:00:27:28:c0:73 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group default qlen 1000
   link/ether 08:00:27:5b:01:9e brd ff:ff:ff:ff:ff:ff
```

INFORMATIVKA

- omogućavanje sučelja
 - `sudo ifconfig enp0s3 up`
- određivanje sučelja na VirtualBoxu



NAT -> DHCP poslužitelj!

```
MIRKO@MIRKO-VIRTUALBOX:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet6 fe80::a00:27ff:fe28:c073 prefixlen 64 scopeid 0x<link>
    ether 08:00:27:28:c0:73 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 29 bytes 3389 (3.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
    inet6 fe80::e51d:398:4e30:d98b prefixlen 64 scopeid 0x<link>
    ether 08:00:27:5b:01:9e txqueuelen 1000 (Ethernet)
    RX packets 341 bytes 32584 (32.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 390 bytes 36569 (36.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 132 bytes 11543 (11.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 132 bytes 11543 (11.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions
```


POSTAVLJANJE IP ADRESE NA „LOKALNO” SUČELJE

- sučelje koje je spojeno na *internal network*

- enp0s3 u ovom slučaju
- pod mreža 192.168.1.0/24

- CHR u istom *internal networku*

- adresa: 192.168.1.40/24
- pingabilno?
- zašto ne radi?



```
mirko@mint-virtualbox:~$ sudo ifconfig enp0s3 192.168.1.100 netmask 255.255.255.0
mirko@mint-virtualbox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.100 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::a00:27ff:fe28:c073 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:28:c0:73 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 40 bytes 5119 (5.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
[admin@MikroTik] > ping 192.168.1.100
```

SEQ	HOST	SIZE	TTL	TIME	STATUS
0	192.168.1.100	56	64	0ms	

```
sent=1 received=1 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms
```

```
[admin@MikroTik] > ping net.hr
invalid value for argument address:
  invalid value of mac-address, mac address required
  invalid value for argument ipv6-address
  while resolving ip-address: could not get answer from dns server
[admin@MikroTik] > _
```

DNS POSLUŽITELJ NA LINUX-U

- instalacija DNS poslužitelj servisa
 - `sudo apt-get update`
 - `sudo apt-get upgrade`
 - instalacija [bind9](#)
 - `sudo apt-get install bind9 bind9utils bind9-doc`

KONFIGURIRANJE DNS MEĐUSPREMNIKA

- engl. *cache*

```
mirko@mint-virtualbox:~$ sudo nano /etc/bind/named.conf.options
```

- dodavanje *forwardera*

- dns server servis nije nadležan za domene
- za *pretvorbu* mora *pitati* nekog – forwardera
- `sudo nano /etc/bind/named.conf.options`
- dodavanje (promjena zapisa)

```
forwarders {  
    1.1.1.1;  
};
```

- resetiranje servis bind9


- `sudo systemctl restart bind9`

```
options {  
    directory "/var/cache/bind";  
  
    forwarders {  
        1.1.1.1;  
    };  
  
    dnssec-validation auto;  
  
    auth-nxdomain no;    # conform to RFC1035  
    listen-on-v6 { any; };  
};
```

INSTALACIJA I KONFIGURACIJA PRIMARNOG DNS POSLUŽITELJA

- konfiguracijska datoteka
 - `sudo nano /etc/bind/named.conf`
 - mora sadržavati (ako ne sadrži, kopiraj!)

```
include "/etc/bind/named.conf.options";  
include "/etc/bind/named.conf.local";  
include "/etc/bind/named.conf.default-zones";
```
- definiranje primarne DNS zone (vlastite)
 - `sudo nano /etc/bind/named.conf.local`
 - ime domene
 - datoteka gdje se nalaze zapisi
 - prefiks: `for.` -> forward lookup zona
 - prefiks: `rev.` -> reverse lookup zona



```
zone "tsc2020.local"{  
    type master;  
    file "/etc/bind/for.tsc2020.local";  
    allow-transfer{};  
    also-notify {};  
};  
  
zone "100.168.192.in-addr.arpa"{  
    type master;  
    file "/etc/bind/rev.tsc2020.local";  
    allow-transfer {};  
    also-notify{};  
};
```

KREIRANJE FORWARD ZONE

- kreiranje datoteke
 - `sudo nano /etc/bind/for.ostechnix.lan`
- primjer konfiguracije
 - poslužitelj će
 - pri.tsc2020.local** pretvoriti u 192.168.1.100
 - mikrotik.tsc2020.local** pretvoriti u 192.168.1.40
 - test.tsc2020.local** pretvoriti u 192.168.1.43

```
$TTL 86400 ;TTL za dns zapis
@      IN SOA pri.tsc.local. root.tsc2020.local. (
        2011071001
        3600
        1800
        604800
        86400; minimalni TTL
)

@      IN      NS      pri.tsc.local.
@      IN      A       192.168.1.100
pri    IN      A       192.168.1.100
test   IN      A       192.168.1.42
mikrotik IN      A       192.168.1.40
```

NS = poslužitelj zadužen
za domenu
A zapis = ime -> IP adresa

PRAVA PRISTUPA I PROVJERA KONFIGURACIJE

- promjena prava pristupa
 - `sudo chmod -R 755 /etc/bind`
 - `sudo chown -R bind:bind /etc/bind`
- ukoliko naredbe ne vrate ništa, DNS konfiguracija je ispravna
 - `sudo named-checkconf /etc/bind/named.conf`
 - `sudo named-checkconf /etc/bind/named.conf.local`
- provjera zone
 - `sudo named-checkzone tsc2020.local /etc/bind/for.tsc2020.local`
 - naredba mora vratiti
zone ime_zone: loaded serial SERIJSKI BROJ ZAPISA
OK
- resetiranje servisa
 - `sudo systemctl restart bind9`

```
mirko@mint-virtualbox:~$ sudo named-checkzone tsc2020.local /etc/bind/for.tsc2020.local
zone tsc2020.local/IN: loaded serial 2011071001
OK
mirko@mint-virtualbox:~$
```


TESTIRANJE

- na CHR-u koji je spojen s Linuxom postaviti DNS poslužitelj IP adresu Linux OS-a
 - ip dns set serves=192.168.1.100

```
[admin@MikroTik] > ip dns print
      servers: 192.168.1.100
      dynamic-servers:
      allow-remote-requests: no
      max-udp-packet-size: 4096
      query-server-timeout: 2s
      query-total-timeout: 10s
      max-concurrent-queries: 100
      max-concurrent-tcp-sessions: 20
      cache-size: 2048KiB
      cache-max-ttl: 1w
      cache-used: 19KiB
[admin@MikroTik] >
```


TESTIRANJE

- ping test.tsc2020.local
 - DNS radi
 - pretvorit se test.tsc2020.local u 192.168.1.42
 - (prema DNS zapisu!)
 - ping *ne prolazi* jer nema uređaja (sučelja) s tom IP adresom!

```
[admin@MikroTik] > ping test.tsc2020.local
```

SEQ	HOST	SIZE	TTL	TIME	STATUS
0	192.168.1.42				timeout
1	192.168.1.42				timeout
2	192.168.1.40	84	64	981ms	host unreachable
3	192.168.1.42				timeout
4	192.168.1.42				timeout
5	192.168.1.42				timeout
6	192.168.1.42				timeout

sent=7 received=0 packet-loss=100%



TESTIRANJE

- `ping pri.tsc2020.local`
 - `pri.tsc2020.local` se *pretvori* u `192.168.1.100`
 - to je IP adresa linux
 - ping prolazi
 - ...

```
[admin@MikroTik] > ping pri.tsc2020.local
  SEQ HOST                       SIZE TTL TIME  STATUS
    0 192.168.1.100                56  64 0ms
    1 192.168.1.100                56  64 0ms
    2 192.168.1.100                56  64 0ms
sent=3 received=3 packet-loss=0% min-rtt=0ms avg-rtt=0ms max-rtt=0ms
```

TESTIRANJE

- korištenje *nslookup* naredbe u RouterOS-u

put [:resolve ALIAS]

- npr put [:resolve tsck.hr]

```
[admin@MikroTik] > put [:resolve tsck.hr]  
193.198.184.131  
[admin@MikroTik] > _
```

- ping ne *prolazi* jer ne postoji ruta do odredišta

```
[admin@MikroTik] > ping tsck.hr  
SEQ HOST                                SIZE TTL TIME  STATUS  
0                                           no route to host  
sent=1 received=0 packet-loss=100%  
[admin@MikroTik] >
```