

## Zad 1

```
root@SRV1:~# apt update
Pobieranie:1 http://security.debian.org/debian-security bookworm-security InRelease [48,0 kB]
Pobieranie:2 http://ftp.pl.debian.org/debian bookworm InRelease [151 kB]
Pobieranie:3 http://ftp.pl.debian.org/debian bookworm-updates InRelease [55,4 kB]
Pobieranie:4 http://security.debian.org/debian-security bookworm-security/non-free-firmware Sources [796 B]
Pobieranie:5 http://security.debian.org/debian-security bookworm-security/main Sources [126 kB]
Pobieranie:6 http://security.debian.org/debian-security bookworm-security/main amd64 Packages [196 kB]
Pobieranie:7 http://security.debian.org/debian-security bookworm-security/main Translation-en [116 kB]
Pobieranie:8 http://security.debian.org/debian-security bookworm-security/non-free-firmware amd64 Packages [688 B]
Pobieranie:9 http://security.debian.org/debian-security bookworm-security/non-free-firmware Translation-en [472 B]
Pobieranie:10 http://ftp.pl.debian.org/debian bookworm/main Sources [9 487 kB]
Pobieranie:11 http://ftp.pl.debian.org/debian bookworm/non-free-firmware Sources [6 436 B]
Pobieranie:12 http://ftp.pl.debian.org/debian bookworm/main amd64 Packages [8 787 kB]
Pobieranie:13 http://ftp.pl.debian.org/debian bookworm/main Translation-en [6 109 kB]
Pobieranie:14 http://ftp.pl.debian.org/debian bookworm/non-free-firmware amd64 Packages [6 236 B]
Pobieranie:15 http://ftp.pl.debian.org/debian bookworm/non-free-firmware Translation-en [20,9 kB]
Pobieranie:16 http://ftp.pl.debian.org/debian bookworm-updates/main Sources [1 260 B]
Pobieranie:17 http://ftp.pl.debian.org/debian bookworm-updates/non-free-firmware Sources [2 076 B]
Pobieranie:18 http://ftp.pl.debian.org/debian bookworm-updates/main amd64 Packages [2 468 B]
Pobieranie:19 http://ftp.pl.debian.org/debian bookworm-updates/main Translation-en [2 928 B]
Pobieranie:20 http://ftp.pl.debian.org/debian bookworm-updates/non-free-firmware amd64 Packages [6 236 B]
Pobieranie:21 http://ftp.pl.debian.org/debian bookworm-updates/non-free-firmware Translation-en [3 472 B]
Pobrano 25,1 MB w 11s (2 347 kB/s)
Czytanie list pakietów... Gotowe
Budowanie drzewa zależności... Gotowe
Odczyt informacji o stanie... Gotowe
97 packages can be upgraded. Run 'apt list --upgradable' to see them.
N: Repozytoryj 'http://ftp.pl.debian.org/debian bookworm InRelease' changed its 'Version' value from '12.0' to '12.7'
root@SRV1:~# _
```

```
SRV2 [Uruchomiona] - Oracle VM VirtualBox
Plik Maszyna Widok Wejście Urządzenia Pomoc
Odczytywanie dzienników zmian... Zrobione
(Odczytywanie bazy danych ... 30868 plików i katalogów obecnie zainstalowanych.)
Przypakowywanie do rozpakowania pakietu .../0-bind9-dnsutils_1%3a9.16.50-1~deb11u2_amd64.deb ...
Rozpakowywanie pakietu bind9-dnsutils (1:9.16.50-1~deb11u2) nad (1:9.16.15-1) ...
Przypakowywanie do rozpakowania pakietu .../1-bind9-libs_1%3a9.16.50-1~deb11u2_amd64.deb ...
Rozpakowywanie pakietu bind9-libs:amd64 (1:9.16.50-1~deb11u2) nad (1:9.16.15-1) ...
Wybieranie wcześniej niewybranego pakietu python3-ply.
Przypakowywanie do rozpakowania pakietu .../2-python3-ply_3.11-4_all.deb ...
Rozpakowywanie pakietu python3-ply (3.11-4) ...
Wybieranie wcześniej niewybranego pakietu bind9-utils.
Przypakowywanie do rozpakowania pakietu .../3-bind9-utils_1%3a9.16.50-1~deb11u2_amd64.deb ...
Rozpakowywanie pakietu bind9-utils (1:9.16.50-1~deb11u2) ...
Wybieranie wcześniej niewybranego pakietu dns-root-data.
Przypakowywanie do rozpakowania pakietu .../4-dns-root-data_2024041801~deb11u1_all.deb ...
Rozpakowywanie pakietu dns-root-data (2024041801~deb11u1) ...
Wybieranie wcześniej niewybranego pakietu bind9.
Przypakowywanie do rozpakowania pakietu .../5-bind9_1%3a9.16.50-1~deb11u2_amd64.deb ...
Rozpakowywanie pakietu bind9 (1:9.16.50-1~deb11u2) ...
Konfigurowanie pakietu bind9-libs:amd64 (1:9.16.50-1~deb11u2) ...
Konfigurowanie pakietu python3-ply (3.11-4) ...
Konfigurowanie pakietu dns-root-data (2024041801~deb11u1) ...
Konfigurowanie pakietu bind9-utils (1:9.16.50-1~deb11u2) ...
Konfigurowanie pakietu bind9 (1:9.16.50-1~deb11u2) ...
Dodawanie grupy "bind" (GID 112)...
Gotowe.
Dodawanie użytkownika systemowego "bind" (UID 106)...
Dodawanie nowego użytkownika "bind" (UID 106) w grupie "bind"...
Nie utworzono katalogu domowego "/var/cache/bind".
wrote key file "/etc/bind/rndc.key"
named-resolvconf.service is a disabled or a static unit, not starting it.
Created symlink /etc/systemd/system/bind9.service + /lib/systemd/system/named.service.
Created symlink /etc/systemd/system/multi-user.target.wants/named.service + /lib/systemd/system/named.service.
Konfigurowanie pakietu bind9-dnsutils (1:9.16.50-1~deb11u2) ...
Przetwarzanie wyzwalaczy pakietu man-db (2.9.4-2)...
Progress: ( 96%) [#####]
```

Apt install bind9,

Następnie wprowadzmy odpowiednie zmiany w pliku, o lokalizacji widocznej poniżej, później wpisujemy :

Systemctl restart bind9 (wydajemy po każdej modyfikacji w plikach z katalogu /etc/bind/)

Powtarzamy na drugiej maszynie



```

/etc/bind/db.contoso.com [-M--] 38 L: [ 1+13 14/ 16] *0
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><-----> 2<----->; Serial
<-----><-----><-----> 15<-----><----->; Refresh
<-----><-----><-----> 15<-----><----->; Retry
<-----><-----><----->15<-----><----->; Expire
<-----><-----><-----> 15 )<->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.211_
@<----->IN<----->A<----->192.168.53.176

```

```

/etc/resolv.conf [-M--] 29
nameserver 192.168.53.176

```

Przed próbą wykonania połączenia zmieniamy adres IPv4 w pliku /etc/resolv.conf (na SRV2), na adres serwera (lub umieszczamy go aby był na pierwszym miejscu)

```

root@debian11:~# ping contoso.com
PING contoso.com (192.168.53.176) 56(84) bytes of data:
64 bytes from 192.168.53.176 (192.168.53.176): icmp_seq=1 ttl=64 time=1.93 ms
64 bytes from 192.168.53.176 (192.168.53.176): icmp_seq=2 ttl=64 time=2.04 ms

```

sprawdzamy połączenie z serwerem

Konfigurujemy drugą maszynę:

```

/etc/bind/named.conf.default-zones [----] 31 L: [ 3+29 32/ 37] *(555 / 604b) 0059 0x03B
<----->type hint;
<----->file "/usr/share/dns/root.hints";
};

// be authoritative for the localhost forward and reverse zones, and for
// broadcast zones as per RFC 1912

zone "localhost" {
<----->type master;
<----->file "/etc/bind/db.localhost";
};

zone "127.0.0.1.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.0.0.0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.255.255.255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type slave;
<----->masters {192.168.53.176;};
<----->file "/var/cache/bind/db.contoso.com";
};

```

Lewy	Plik	Polecenie	Opcje	Prawy
<	/var/cache/bind			.[""]>
..	Nazwa	Rozmiar	Modyfikacja	
..		NADRZED	7 lis, 20:17	
	db.contoso.com	197	7 lis, 21:56	
	managed-keys.bind	297	7 lis, 21:57	
	managed-keys.bind.jnl	1697	7 lis, 21:56	

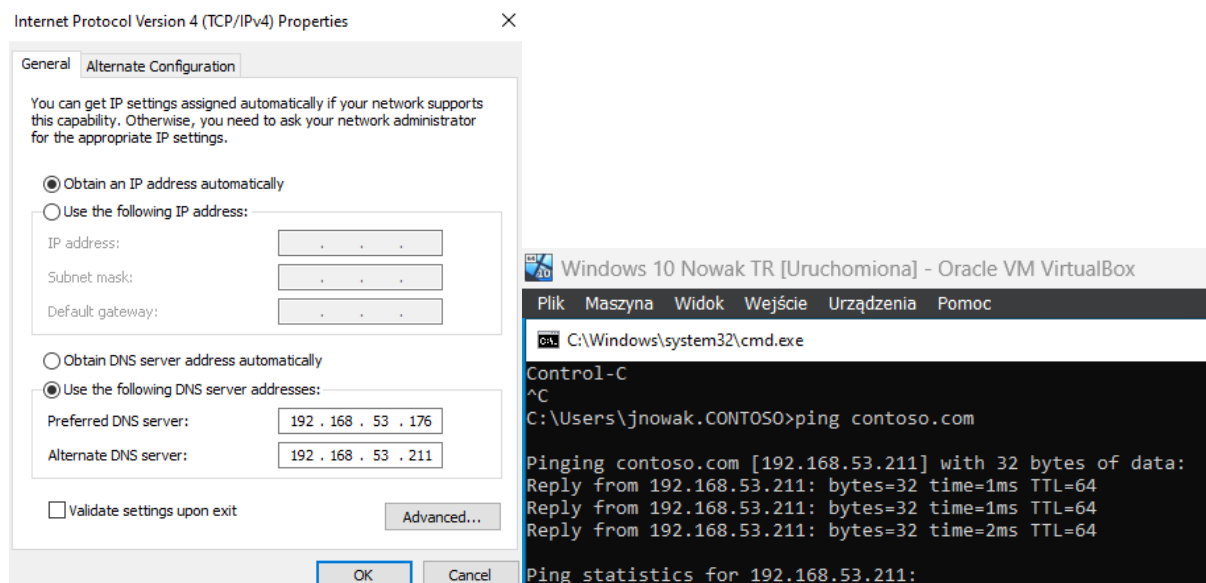
Powstał nowy plik, po powyższych działaniach

Dodanie zapasowego adresu IP + dodanie odpowiednich wartości czasowych (ważność rekordów, sprawdzanie zmian na serwerze nadrzędnym). Po modyfikacjach w plikach z /etc/bind należy pamiętać o wpisaniu komendy: `systemctl restart bind9`

```
/etc/bind/db.contoso.com [-M--] 24 L: [ 1+ 7 8/ 16] *(141 /
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><----->2<-----><----->; Serial
<-----><-----><----->3600<--><----->; Refresh
<-----><-----><----->1200<--><----->; Retry
<-----><-----><----->2419200<----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.211
@<----->IN<----->A<----->192.168.53.176
```

Sprawdzenie połączenia z serwerem (na 3 maszynie z Denianem i na innej z Windowsem)(SRV1 jest wyłączony). Należy pamiętać o edycji pliku /etc/resolv.conf na debianie.

```
root@debian11:~# ping contoso.com
ping: contoso.com: Ta nazwa lub usługa jest nieznaną
root@debian11:~# ping contoso.com
PING contoso.com (192.168.53.211) 56(84) bytes of data:
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=1 ttl=64 time=1.99 ms
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=2 ttl=64 time=2.33 ms
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=3 ttl=64 time=1.93 ms
^C
--- contoso.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 1.928/2.081/2.327/0.175 ms
root@debian11:~# _
```



Skonfigurować na serwerze nadrzędnym możliwość transferu strefy tylko dla skonfigurowanego wcześniej serwera podrzędnego:

```

/etc/bind/named.conf.default-zones [----] 38 L:[ 4+29 33/ 38] *(564
<----->file "/usr/share/dns/root.hints";
};

// be authoritative for the localhost forward and reverse zones, and for
// broadcast zones as per RFC 1912

zone "localhost" {
<----->type master;
<----->file "/etc/bind/db.localhost";
};

zone "127.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type master;
<----->allow-transfer {192.168.53.211;};
<----->file "/etc/bind/db.contoso.com";
};

```

Poniżej próba transferu strefy  
z nieprzypisanego hosta

```

root@debian11:~# dig contoso.com AXFR
; <<> DiG 9.16.15-Debian <<> contoso.com AXFR
;; global options: +cmd
; Transfer failed.
root@debian11:~#

```

```

root@SRV2: ~# dig contoso.com AXFR
; <<> DiG 9.16.50-Debian <<> contoso.com AXFR
;; global options: +cmd
contoso.com.      604800 IN      SOA      contoso.com. root.contoso.com. 2 15 15 15 15
contoso.com.      604800 IN      NS       dns2.contoso.com.
contoso.com.      604800 IN      NS       contoso.com.
contoso.com.      604800 IN      A        192.168.53.176
dns2.contoso.com. 604800 IN      A        192.168.53.211
contoso.com.      604800 IN      SOA      contoso.com. root.contoso.com. 2 15 15 15 15
;; Query time: 4 msec
;; SERVER: 192.168.53.176#53(192.168.53.176)
;; WHEN: Sun Nov 17 01:19:56 CET 2024
;; XFR size: 6 records (messages 1, bytes 210)
root@SRV2:~#

```

Ta sama próba z SRV2 (na który jest możliwy transfer strefy)

## Zad 2

Dodajemy odpowiednie wpisy w poniższym pliku i zmieniamy numer strefy na wyższy, następnie wpisujemy: `systemctl restart bind9`

```

/etc/bind/db.contoso.com [-M--] 25 L:[ 1+ 5 6/ 21] *(108 / 395
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><----->4<-----><----->; Serial
<-----><-----><----->3600<-----><----->; Refresh
<-----><-----><----->1200<-----><----->; Retry
<-----><-----><----->2419200<-----><----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.211
@<----->IN<----->A<----->192.168.53.176
sprzedaz<----->IN<----->A<----->192.168.100.10
www.sprzedaz<-->IN<----->CNAME<-->sprzedaz
intranet<----->IN<----->CNAME<-->sprzedaz

```

C:\Windows\system32\cmd.exe

```
C:\Users\jnowak.CONTOSO>nslookup sprzedaz.contoso.com
Server:   Unknown
Address:  192.168.53.176

Name:     sprzedaz.contoso.com
Address:  192.168.100.10

C:\Users\jnowak.CONTOSO>nslookup www.sprzedaz.contoso.com
Server:   Unknown
Address:  192.168.53.176

Name:     sprzedaz.contoso.com
Address:  192.168.100.10
Aliases:  www.sprzedaz.contoso.com

C:\Users\jnowak.CONTOSO>nslookup intranet.contoso.com
Server:   Unknown
Address:  192.168.53.176

Name:     sprzedaz.contoso.com
Address:  192.168.100.10
Aliases:  intranet.contoso.com

C:\Users\jnowak.CONTOSO>
```

```
root@debian11:~# dig IN TXT www.sprzedaz.contoso.com

; <<>> DiG 9.16.15-Debian <<>> IN TXT www.sprzedaz.contoso.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 14181
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 1232
;; COOKIE: 29129394dc18a6ce01000000673c8b42df92eaa0e62b937a (good)
;; QUESTION SECTION:
;www.sprzedaz.contoso.com.      IN      TXT

;; ANSWER SECTION:
www.sprzedaz.contoso.com. 604800 IN      CNAME   sprzedaz.contoso.com.

;; AUTHORITY SECTION:
contoso.com.                604800 IN      SOA     contoso.com. root.contoso.com. 9 3600 1200 2419200 604800

;; Query time: 12 msec
;; SERVER: 192.168.53.176#53(192.168.53.176)
;; WHEN: wto lis 19 13:57:36 CET 2024
;; MSG SIZE rcvd: 147
```

### Zad 3

Nanosimy odpowiednie zmiany w poniższym pliku (na SRV1), po zamknięciu wydajemy polecenie: `systemctl restart bind9`

```
/etc/bind/db.contoso.com [BM--] 26 L:[ 1+ 5 6/ 30] *(109 / 549b) 0009 0x009
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><----->10<-----><----->; Serial
<-----><-----><----->3600<-----><----->; Refresh
<-----><-----><----->1200<-----><----->; Retry
<-----><-----><----->2419200<-----><----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.211
@<----->IN<----->A<----->192.168.53.176

sprzedaz<----->IN<----->A<----->192.168.100.10
www.sprzedaz<-->IN<----->CNAME<-->sprzedaz
intranet<----->IN<----->CNAME<-->sprzedaz

@<----->IN<----->MX<----->10<----->mail
mail<--><----->IN<----->A<----->192.168.0.12

_sip._udp<----->IN<----->SRV<----->0<----->0<----->5060<-->sip1
sip1<--><----->IN<----->A<----->192.168.0.13

_sip._udp<----->IN<----->SRV<----->1<----->0<----->5060<-->sip2
sip2<--><----->IN<----->A<----->192.168.0.14
```

Wydajemy polecenie `dig` w celu sprawdzenia efektów naniesionych zmian:

```
root@debian11:~# dig IN MX contoso.com

; <<>> DiG 9.16.15-Debian <<>> IN MX contoso.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 12559
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 4b591723ce728a4801000000673ca89ff68736e8daeafa1a (good)
;; QUESTION SECTION:
;contoso.com.                IN      MX

;; ANSWER SECTION:
contoso.com.                604800  IN      MX      10 mail.contoso.com.

;; ADDITIONAL SECTION:
mail.contoso.com.          604800  IN      A        192.168.0.12

;; Query time: 11 msec
;; SERVER: 192.168.53.176#53(192.168.53.176)
;; WHEN: wto lis 19 16:05:48 CET 2024
;; MSG SIZE rcvd: 105

root@debian11:~# _
```

```

root@debian11:~# dig IN SRV _sip._udp.contoso.com

; <<>> DiG 9.16.15-Debian <<>> IN SRV _sip._udp.contoso.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 3991
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 46f452821f16394301000000673ca8dfc26eb2eedcde7653 (good)
;; QUESTION SECTION:
;_sip._udp.contoso.com.      IN      SRV

;; ANSWER SECTION:
_sip._udp.contoso.com.  604800  IN      SRV      0 0 5060 sip1.contoso.com.
_sip._udp.contoso.com.  604800  IN      SRV      1 0 5060 sip2.contoso.com.

;; ADDITIONAL SECTION:
sip1.contoso.com.      604800  IN      A          192.168.0.13
sip2.contoso.com.      604800  IN      A          192.168.0.14

;; Query time: 8 msec
;; SERVER: 192.168.53.176#53(192.168.53.176)
;; WHEN: wto lis 19 16:06:51 CET 2024
;; MSG SIZE rcvd: 182

root@debian11:~# _

```

#### Zad 4

Nanosimy zmiany na SRV1, w poniższym pliku

```

/etc/bind/db.contoso.com [BM--] 26 L:[ 1+ 5 6/ 31] *(109 /
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><----->11<-----><----->; Serial
<-----><-----><----->3600<--><----->; Refresh
<-----><-----><----->1200<--><----->; Retry
<-----><-----><----->2419200<-----><----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.211
@<----->IN<----->A<----->192.168.53.176
sprzedaz<----->IN<----->A<----->192.168.53.176
sprzedaz<----->IN<----->A<----->192.168.53.211
www.sprzedaz<-->IN<----->CNAME<-->sprzedaz
intranet<----->IN<----->CNAME<-->sprzedaz

@<----->IN<----->MX<----->10<----->mail
mail<--><----->IN<----->A<----->192.168.0.12

_sip._udp<----->IN<----->SRV<---->0<----->0<----->5060<-->sip1
sip1<--><----->IN<----->A<----->192.168.0.13

_sip._udp<----->IN<----->SRV<---->1<----->0<----->5060<-->sip2
sip2<--><----->IN<----->A<----->192.168.0.14

```



Sprawdzenie jakie zmiany wprowadza taka modyfikacja:

```
root@debian11:~# ping sprzedaz.contoso.com
PING sprzedaz.contoso.com (192.168.53.211) 56(84) bytes of data.
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=1 ttl=64 time=3.50 ms
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=2 ttl=64 time=2.24 ms
^C
--- sprzedaz.contoso.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 2.240/2.868/3.496/0.628 ms
root@debian11:~# ping sprzedaz.contoso.com
PING sprzedaz.contoso.com (192.168.53.211) 56(84) bytes of data.
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=1 ttl=64 time=1.67 ms
64 bytes from 192.168.53.211 (192.168.53.211): icmp_seq=2 ttl=64 time=2.38 ms
^C
--- sprzedaz.contoso.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1003ms
rtt min/avg/max/mdev = 1.673/2.024/2.375/0.351 ms
root@debian11:~# ping sprzedaz.contoso.com
PING sprzedaz.contoso.com (192.168.53.176) 56(84) bytes of data.
64 bytes from 192.168.53.176 (192.168.53.176): icmp_seq=1 ttl=64 time=1.74 ms
64 bytes from 192.168.53.176 (192.168.53.176): icmp_seq=2 ttl=64 time=1.91 ms
^C
--- sprzedaz.contoso.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 1.739/1.822/1.905/0.083 ms
root@debian11:~#
```

(raz jesteśmy łączni z SRV1 a raz z SRV2)

## Zad 5

Dodajemy poniższy tekst w poniższym pliku (SRV1) lub allow-recursion{adres IPV4};

```
/etc/bind/named.conf.options [-M--] 21 L:[ 1+22 23/ 25] *(856 / 860b) 0010 0x000
options {
<----->directory "/var/cache/bind";

<----->// If there is a firewall between you and nameservers you want
<----->// to talk to, you may need to fix the firewall to allow multiple
<----->// ports to talk. See http://www.kb.cert.org/vuls/id/800113

<----->// If your ISP provided one or more IP addresses for stable.
<----->// nameservers, you probably want to use them as forwarders...
<----->// Uncomment the following block, and insert the addresses replacing.
<----->// the all-0's placeholder.

<----->// forwarders {
<----->// <---->0.0.0.0;
<----->// };
<----->//=====
<----->// If BIND logs error messages about the root key being expired,
<----->// you will need to update your keys. See https://www.isc.org/bind-keys
<----->//=====
<----->dnssec-validation auto;

<----->listen-on-v6 { any; };
<----->recursion no;
};
```

Sprawdzenie działania (na hoście korzystającym z usługi serwera)

```
root@SRV2:~# ping wp.pl
ping: wp.pl: Odwzorowanie nazwy jest chwilowo niemożliwe
root@SRV2:~# ping contoso.com
PING contoso.com (192.168.53.176) 56(84) bytes of data.
64 bytes from 192.168.53.176: icmp_seq=1 ttl=64 time=2.11 ms
64 bytes from 192.168.53.176: icmp_seq=2 ttl=64 time=3.10 ms
^C
--- contoso.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1108ms
rtt min/avg/max/mdev = 2.107/2.605/3.103/0.498 ms
root@SRV2:~# _
```

```

Microsoft Windows [Version 10.0.19043.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\jnowak.CONTOSO>nslookup wp.pl
Server:      UnKnown
Address:     192.168.53.176

*** UnKnown can't find wp.pl: Query refused

C:\Users\jnowak.CONTOSO>nslookup contoso.com
Server:      UnKnown
Address:     192.168.53.176

Name:       contoso.com
Address:    192.168.53.176

C:\Users\jnowak.CONTOSO>nslookup sprzedaz.contoso.com
Server:      UnKnown
Address:     192.168.53.176

Name:       sprzedaz.contoso.com
Addresses:  192.168.53.211
            192.168.53.176

C:\Users\jnowak.CONTOSO>_

```

## Zad 6

Modyfikujemy pliki (na SRV2) i wydajemy polecenie: `systemctl restart bind9`:

```

/etc/bind/named.conf.default-zones [BM--] 41 L: [ 8+30 38/ 41] *(675 / 682b)
// broadcast zones as per RFC 1912

zone "localhost" {
<----->type master;
<----->file "/etc/bind/db.localhost";
};

zone "127.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type slave;
<----->masters {192.168.53.176;};
<----->file "/var/cache/bind/db.contoso.com";
};

zone "intranet.local" {
<----->type master;
<----->file "/etc/bind/db.intranet.local";
};

```

```

/etc/bind/db.intranet.local  [-M--] 38 L:[ 1+12 13/ 15] *(26
;
; 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<----->intranet.local.
@<----->IN<----->A<----->192.168.53.211_

```

Sprawdzenie działania:

```

root@SRV1:~# nslookup
> intranet.local
Server:      192.168.53.107
Address:     192.168.53.107#53

** server can't find intranet.local: NXDOMAIN
> server 192.168.53.211
Default server: 192.168.53.211
Address: 192.168.53.211#53
> intranet.local
Server:      192.168.53.211
Address:     192.168.53.211#53

Name:   intranet.local
Address: 192.168.53.211
>

```

Dodajemy „przesyłanie” na SRV1: (modyfikujemy poniższy plik)

```

/etc/bind/named.conf.default-zones  [-M--] 8 L:[ 8+30 38
// broadcast zones as per RFC 1912

zone "localhost" {
<----->type master;
<----->file "/etc/bind/db.local";
};

zone "127.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type master;
<----->allow-transfer {192.168.53.211;};
<----->file "/etc/bind/db.contoso.com";
};

zone "intranet.local"{
<----->type forward;
<----->forward only;
<----->forwarders {192.168.53.211;};
};

```

Nanosimy jeszcze odpowiednie zmiany w poniższym pliku (SRV1) (zmieniamy „auto” na „no”), oraz usuwamy „recursion no”

```
/etc/bind/named.conf.options [----] 30 L:[ 1+21 22/ 24] *(839 / 843b) 0010 0x00A
options {
<----->directory "/var/cache/bind";

<----->/// If there is a firewall between you and nameservers you want
<----->/// to talk to, you may need to fix the firewall to allow multiple
<----->/// ports to talk.  See http://www.kb.cert.org/vuls/id/800113

<----->/// If your ISP provided one or more IP addresses for stable.
<----->/// nameservers, you probably want to use them as forwarders...
<----->/// Uncomment the following block, and insert the addresses replacing.
<----->/// the all-0's placeholder.

<----->/// forwarders {
<----->/// <---->0.0.0.0;
<----->/// };

<----->/// If BIND logs error messages about the root key being expired,
<----->/// you will need to update your keys.  See https://www.isc.org/bind-keys
<----->///
<----->dnssec-validation no;

<----->listen-on-v6 { any; };_
};
```

Sprawdzenie działania:

```
root@debian11:~# nslookup
> server 192.168.53.176
Default server: 192.168.53.176
Address: 192.168.53.176#53
> intranet.local
Server:          192.168.53.176
Address:         192.168.53.176#53

Non-authoritative answer:
Name:   intranet.local
Address: 192.168.53.211
```

## Zad 7

Na SRV2 (który deklaruje domenę intranet.local) w poniższym pliku nanosimy zmiany:

```
/etc/bind/named.conf.default-zones [-M--] 31 L:[ 9+31 40/ 45] *(701
zone "localhost" {
<----->type master;
<----->file "/etc/bind/db.localhost";
};

zone "127.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type slave;
<----->masters {192.168.53.176;};
<----->file "/var/cache/bind/db.contoso.com";
};

zone "intranet.local" {
<----->type master;
<----->notify yes;
<----->allow-update {none;};
<----->allow-query {0.0.0.0;};
<----->allow-transfer {192.168.53.176;};
<----->file "/etc/bind/db.intranet.local";
};
```

Na SRV1 (gdzie tworzymy strefę skrótową) modyfikujemy plik:

```
/etc/bind/named.conf.default-zones  [-M--] 49 L:[
<----->type master;
<----->file "/etc/bind/db.local";
};

zone "127.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type master;
<----->allow-transfer {192.168.53.211;};
<----->file "/etc/bind/db.contoso.com";
};

zone "intranet.local"{
<----->type stub;
<----->masters {192.168.53.211;};
<----->masterfile-format text;
<----->file "/var/cache/bind/db.intranet.local";
};
```

Nowoutworzony plik w wyniku powyższych działań (SRV1):

```
/var/cache/bind/db.intranet.local  [----]  0 L:[  1+ 0  1/ 12
$ORIGIN .
$TTL 604800<--->; 1 week
intranet.local<----->IN SOA<----->localhost. root.localhost. (
<-----><-----><-----><----->2          ; serial
<-----><-----><-----><----->604800      ; refresh (1 week)
<-----><-----><-----><----->86400       ; retry (1 day)
<-----><-----><-----><----->2419200     ; expire (4 weeks)
<-----><-----><-----><----->604800      ; minimum (1 week)
<-----><-----><-----><----->)
<-----><-----><----->NS<----->intranet.local.
<-----><-----><----->A<----->192.168.53.211
```

```
root@debian11:~# nslookup
> server 192.168.53.176
Default server: 192.168.53.176
Address: 192.168.53.176#53
> intranet.local
Server:          192.168.53.176
Address:         192.168.53.176#53

Non-authoritative answer:
Name:   intranet.local
Address: 192.168.53.211
>
```

## Zad 8

Na SRV2 modyfikujemy poniższy plik i restartujemy bind:

```
/etc/bind/named.conf.options [BM--] 21 L: [ 1+14 15/ 26] *(495 / 849b) 0046 0x02E
options {
<----->directory "/var/cache/bind";

<----->/// If there is a firewall between you and nameservers you want
<----->/// to talk to, you may need to fix the firewall to allow multiple
<----->/// ports to talk.  See http://www.kb.cert.org/vuls/id/800113

<----->/// If your ISP provided one or more IP addresses for stable.
<----->/// nameservers, you probably want to use them as forwarders...
<----->/// Uncomment the following block, and insert the addresses replacing.
<----->/// the all-0's placeholder.

<-----> forwarders {
<-----><----->8.8.8.8;
<-----><----->8.8.4.4;
<----->};

<----->///=====
<----->/// If BIND logs error messages about the root key being expired,
<----->/// you will need to update your keys.  See https://www.isc.org/bind-keys
<----->///=====
<----->dnssec-validation auto;

<----->listen-on-v6 { any; };
};
```

W celu sprawdzenia poprawności instalujemy tcpdump (sniffer):

```
Plik Maszyna Widok Wejście Urządzenia Pomoc
root@SRV2:~# apt install tcpdump
czytanie list pakietów... Gotowe
udowanianie drzewa zależności... Gotowe
dczyt informacji o stanie... Gotowe
the following additional packages will be installed:
  libpcap0.8
ostaną zainstalowane następujące NOWE pakiety:
  libpcap0.8 tcpdump
  aktualizowanych, 2 nowo instalowanych, 0 usuwanych i 131 nieaktualizowanych.
nieczne pobranie 625 kB archiwów.
o tej operacji zostanie dodatkowo użyte 1 744 kB miejsca na dysku.
ontynuować? [Y/n] Y
obieranie:1 http://ftp.pl.debian.org/debian bullseye/main amd64 libpcap0.8 amd64
obieranie:2 http://ftp.pl.debian.org/debian bullseye/main amd64 tcpdump amd64 4.
kB]
obrano 625 kB w 1s (1 038 kB/s)
[SWybieranie wcześniej niewybranego pakietu libpcap0.8:amd64.
Odczytywanie bazy danych ... 31005 plików i katalogów obecnie zainstalowanych.)
rzychotowywanie do rozpakowania pakietu .../libpcap0.8_1.10.0-2_amd64.deb ...
ozpakowywanie pakietu libpcap0.8:amd64 (1.10.0-2) ...

progress: [ 22%] [#####]
```

Odpalamy sniffera na SRV2 i na innym urządzeniu pingujemy powolną domenę globalną (u mnie google.pl), wyniki obserwacji na SRV2:

```
root@SRV2: # tcpdump dst 8.8.8.8
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), snapshot length 262144 bytes
13:11:38.572979 IP 192.168.53.211.56312 > dns.google.domain: 61775+% [1au] A? google.pl. (50)
13:11:38.573648 IP 192.168.53.211.40019 > dns.google.domain: 49366+% [1au] AAAA? google.pl. (50)
```

## Zad 9

Wprowadźmy zmiany w poniższym pliku (SRV2) (w międzyczasie został mi przypisany adres 192.168.53.210 zamiast 192.168.54.211 na SRV2)

```
/etc/bind/named.conf.default-zones [BM--] 34 L: [ 16+31
<----->type master;
<----->file "/etc/bind/db.127";
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type slave;
<----->masters {192.168.53.176;};
<----->file "/var/cache/bind/db.contoso.com";
};

zone "intranet.local" {
<----->type master;
<----->notify yes;
<----->allow-update {none;};
<----->allow-query {0.0.0.0/0;};
<----->allow-transfer {192.168.53.176;};
<----->file "/etc/bind/db.intranet.local";
};

zone "krakow.contoso.com" {
<----->type master;
<----->file "/etc/bind/db.krakow.contoso.com";
};
```

Tworzymy nowy plik na SRV2:

```
/etc/bind/db.krakow.contoso.com [-M--] 31 L: [ 1+ 5 6/ 14] *(126 /
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->krakow.contoso.com. ja.krakow.contoso.com. (
<-----><-----><-----> 6<----->; Serial
<-----><-----><-----> 604800<----->; Refresh
<-----><-----><-----> 86400<----->; Retry
<-----><-----><----->2419200<----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->krakow.contoso.com.
@<----->IN<----->A<----->192.168.53.210
```

Na SRV1 modyfikujemy plik:

```
/etc/bind/db.contoso.com [----] 38 L:[ 1+32 33/ 34] *(632 / 632)
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
<-----><-----><----->14<-----><----->; Serial
<-----><-----><----->3600<--><----->; Refresh
<-----><-----><----->1200<--><----->; Retry
<-----><-----><----->2419200<-----><----->; Expire
<-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.53.210
@<----->IN<----->A<----->192.168.53.176

sprzedaz<----->IN<----->A<----->192.168.53.176
sprzedaz<----->IN<----->A<----->192.168.53.210
www.sprzedaz<-->IN<----->CNAME<-->sprzedaz
intranet<----->IN<----->CNAME<-->sprzedaz

@<----->IN<----->MX<----->10<----->mail
mail<--><----->IN<----->A<----->192.168.0.12

_sip._udp<----->IN<----->SRV<----->0<----->0<----->5060<-->sip1
sip1<--><----->IN<----->A<----->192.168.0.13

_sip._udp<----->IN<----->SRV<----->1<----->0<----->5060<-->sip2
sip2<--><----->IN<----->A<----->192.168.0.14

krakow<-->IN<----->NS<----->ns3.contoso.com.
ns3<-->IN<----->A<----->192.168.53.210
```

Sprawdzenie działania na innym hoście:

```
root@debian11:~# nslookup
> server 192.168.53.176
Default server: 192.168.53.176
Address: 192.168.53.176#53
> krakow.contoso.com
Server:          192.168.53.176
Address:         192.168.53.176#53

Non-authoritative answer:
Name:   krakow.contoso.com
Address: 192.168.53.210
>
```



## Zad 10

Modyfikujemy plik (na SRV1) i restartujemy bind:

```
/etc/bind/named.conf.default-zones  [-M--] 21 L:[ 18+27 45/ 52] *(76
};

zone "0.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type master;
<----->allow-transfer {192.168.53.210;};
<----->file "/etc/bind/db.contoso.com";
};

zone "intranet.local"{
<----->type stub;
<----->masters {192.168.53.210;};
<----->masterfile-format text;
<----->file "/var/cache/bind/db.intranet.local";
};

zone "100.168.192.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.100.168.192.in-addr.arpa";
};
```

Sprawdzamy działanie na osobnym hoście:

```
root@debian11:~# nslookup 192.168.100.10
10.100.168.192.in-addr.arpa      name = contoso.com.
root@debian11:~#
```

Modyfikujemy poniższy plik (na SRV2) i restartujemy bind:

```
/etc/bind/named.conf.default-zones  [-M--]  8 L: [ 21+31  52/ 5
<----->type master;
<----->file "/etc/bind/db.0";
};

zone "255.in-addr.arpa" {
<----->type master;
<----->file "/etc/bind/db.255";
};

zone "contoso.com" {
<----->type slave;
<----->masters {192.168.53.176};
<----->file "/var/cache/bind/db.contoso.com";
};

zone "intranet.local" {
<----->type master;
<----->notify yes;
<----->allow-update {none};
<----->allow-query {0.0.0.0/0};
<----->allow-transfer {192.168.53.176};
<----->file "/etc/bind/db.intranet.local";
};

zone "krakow.contoso.com" {
<----->type master;
<----->file "/etc/bind/db.krakow.contoso.com";
};

zone "100.168.192.in-addr.arpa"{
<----->type slave;
<----->masters {192.168.53.176};
<----->file "var/cache/bind/db.100.168.192.in-addr.arpa";
};
```

Zmieniam adres na trzecim hoście na adres SRV2 i powtarzam sprawdzanie działania:

```
/etc/resolv.conf  [----]  25 L
nameserver 192.168.53.210

root@debian11:~# nslookup 192.168.100.10
10.100.168.192.in-addr.arpa      name = contoso.com.
root@debian11:~#
```

## Zad 11

Niestety nie dostawałem odpowiedzi z „bank.pl”, więc postąpiłem się domeną „onet.pl”. Zrzucam zawartość pamięci podręcznej do pliku: `rndc dumpdb -cache`. Sprawdzam wpisy dotyczące onet.pl (przed dokonaniem jakiegokolwiek zapytania), następnie wydaje poniższe komendy.

```
root@debian:~# grep onet.pl /var/cache/bind/named_dump.db
root@debian:~# dig @127.0.0.1 onet.pl

; <<> DiG 9.18.28-1~deb12u2-Debian <<> @127.0.0.1 onet.pl
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18085
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 7d5ec325a6940ba201000000674a5256136496fe88ff2666 (good)
;; QUESTION SECTION:
;onet.pl.                IN      A

;; ANSWER SECTION:
onet.pl.                 60      IN      A      13.227.146.25
onet.pl.                 60      IN      A      13.227.146.64
onet.pl.                 60      IN      A      13.227.146.66
onet.pl.                 60      IN      A      13.227.146.122

;; Query time: 1019 msec
;; SERVER: 127.0.0.1#53(127.0.0.1) (UDP)
;; WHEN: Sat Nov 30 00:46:30 CET 2024
;; MSG SIZE rcvd: 128

root@debian:~# rndc dumpdb -cache
root@debian:~# grep onet.pl /var/cache/bind/named_dump.db
onet.pl.                86379   NS      ns5.ringpublishing.net.
root@debian:~#
```

Nowoutworzony plik:

```
/var/cache/bind/named_dump.db [----] 0 L: [ 1+ 0 1/753] *(0 /27863b) 0059 0x0
;
; Start view _default
;
; Cache dump of view '_default' (cache _default)
;
; using a 0 second stale ttl
$DATE 20241129234650
; secure
.<-----><----->517743<----->IN NS<----->a.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->b.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->c.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->d.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->e.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->f.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->g.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->h.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->i.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->j.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->k.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->l.root-servers.net.
<-----><-----><----->517743<----->IN NS<----->m.root-servers.net.
; secure
<-----><-----><----->517743<----->RRSIG<----->NS 8 0 518400 (
<-----><-----><-----><-----><----->20241212170000 20241129160000 61050 .
<-----><-----><-----><-----><----->N1e8ax7KUKcr32A47mt9+y/bA/wXTuHcs7Tu
<-----><-----><-----><-----><----->nJJJoYKp0T6Sg2N2m7t40bQRMnAhKvMQCyV2h
<-----><-----><-----><-----><----->uiyzmZr+XvHP7p/gF5LfjD8jLmFTDk4d9uc
<-----><-----><-----><-----><----->tJ0Q7PRrF6zh6vdk71WwV0nI14FQDPJXgDwd
<-----><-----><-----><-----><----->zEVgTl6jzDlehNgX9iAnzJcu0ExCIJo0wRBj
<-----><-----><-----><-----><----->L2dx9C8RqM7AKR7TkVg15GmXYpHFULtVwa7s
<-----><-----><-----><-----><----->iSNCQq2pUz4yc6p/01L9rq52tceUHZawRY5B
<-----><-----><-----><-----><----->V9DqHn50XWmQ15cJ835vFABG573JoL2FkX4/
<-----><-----><-----><-----><----->f1+WPZmRw5d+FNX9o4GfQj93X3ZV7ADWlrJKt
<-----><-----><-----><-----><----->E6YpvHtXKf4dNS6jWg== )
1Pomoc 2Zapisz 3Zaznacz 4Zastap 5Kopiuuj 6Przen 7Szukaj 8Usuń 9H
```

## Zad 12

Na SRV1 modyfikujemy poniższy plik:

```
/etc/bind/named.conf.default-zones [----] 0 L: [ 1+ 0 1/ 73] *(0 /115)

view "special" {
    <----->match-clients { 192.168.96.64; };
    <----->recursion no;

    zone "contoso.com" {
        <----->type master;
        <----->notify yes;
        <----->allow-update{none;};
        <----->allow-transfer {192.168.96.210;};
        <----->allow-query {0.0.0.0/0;};
        <----->file "/etc/bind/db.special.contoso.com";
    };
};

view "normal" {
    <----->match-clients { any; };
    <----->recursion yes;

    // prime the server with knowledge of the root servers
    zone "." {
        <----->type hint;
        <----->file "/usr/share/dns/root.hints";
    };

    // be authoritative for the localhost forward and reverse zones, and for
    // broadcast zones as per RFC 1912
}
```

Tworzymy zadeklarowany powyżej plik (zrobiłem to przez skopiowanie db.contoso.com) i wprowadzamy odpowiednie zmiany:

```
/etc/bind/db.special.contoso.com [----] 26 L: [ 1+ 5 6/ 37] *(1)
;
; BIND data file for local loopback interface
;
$TTL<-->604800
@<----->IN<----->SOA<----->contoso.com. root.contoso.com. (
    <-----><-----><----->17<-----><----->; Serial
    <-----><-----><----->3600<--><----->; Refresh
    <-----><-----><----->1200<--><----->; Retry
    <-----><-----><----->2419200<-----><----->; Expire
    <-----><-----><-----> 604800 )<----->; Negative Cache TTL
;
@<----->IN<----->NS<----->contoso.com.
@<----->IN<----->NS<----->dns2.contoso.com.
dns2<-->IN<----->A<----->192.168.96.210

@<----->IN<----->A<----->1.1.1.1

sprzedaz<----->IN<----->A<----->192.168.96.176
sprzedaz<----->IN<----->A<----->192.168.96.210
www.sprzedaz<-->IN<----->CNAME<-->sprzedaz
intranet<----->IN<----->CNAME<-->sprzedaz
```

Na hoście korzystającym z usług naszego serwera wydajemy poniższe polecenie:

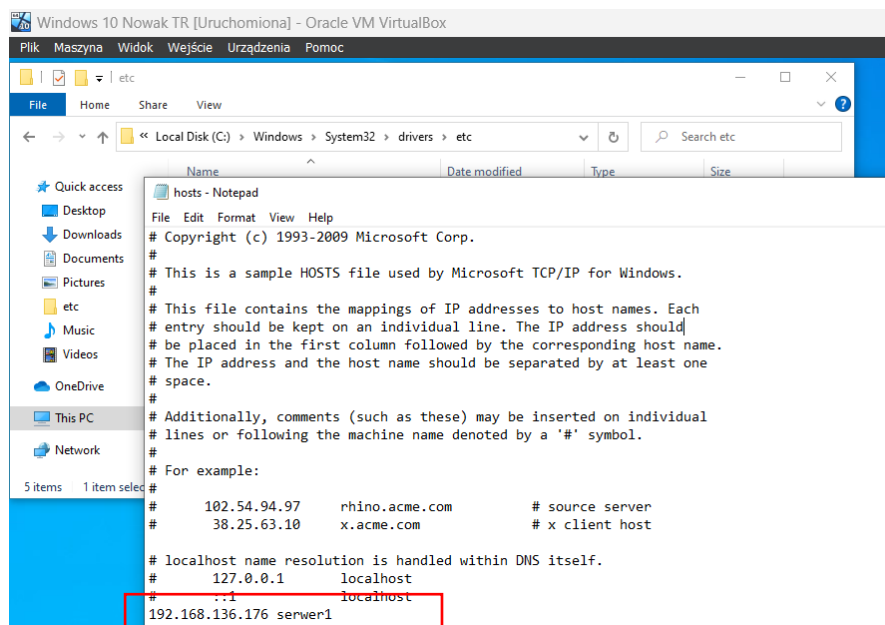
```
/etc/resolv.conf [----] 25
nameserver 192.168.96.176

root@debian:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:86:cc:bf brd ff:ff:ff:ff:ff:ff
    inet 192.168.96.64/24 brd 192.168.96.255 scope global dynamic enp0s3
        valid_lft 2575sec preferred_lft 2575sec
    inet6 fe80::a00:27ff:fe86:ccbf/64 scope link
        valid_lft forever preferred_lft forever

root@debian:~# ping contoso.com
PING contoso.com (1.1.1.1) 56(84) bytes of data:
64 bytes from 1.1.1.1: icmp_seq=1 ttl=52 time=69.9 ms
64 bytes from 1.1.1.1: icmp_seq=2 ttl=52 time=36.5 ms
64 bytes from 1.1.1.1: icmp_seq=3 ttl=52 time=28.8 ms
^C
--- contoso.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2005ms
rtt min/avg/max/mdev = 28.832/45.081/69.868/17.807 ms
root@debian:~# _
```

## Zad 13

Odszukujemy plik po ścieżce widocznej poniżej. Modyfikujemy, poprzez dopisanie testu widocznego w ostatnim wierszu (wpisałem adres IPv4 SRV1, w celu sprawdzenia działania pingu). W wierszu poleceń podajemy ping i przypisaną nawę



```

Microsoft Windows [Version 10.0.19043.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\jnowak.CONTOSO>ping serwer1

Pinging serwer1 [192.168.136.176] with 32 bytes of data:
Reply from 192.168.136.176: bytes=32 time=2ms TTL=64
Reply from 192.168.136.176: bytes=32 time=3ms TTL=64

Ping statistics for 192.168.136.176:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 3ms, Average = 2ms
Control-C
^C
C:\Users\jnowak.CONTOSO>

```

## Zad 14

Wydajemy poniższe polecenia w celu pobrania i sprawdzenia działania, dodatkowo sprawdzamy nowoutworzone pliki

```

root@SRV2:~# apt install nscd
Czytanie list pakietów... Gotowe
Budowanie drzewa zależności... Gotowe
Odczyt informacji o stanie... Gotowe
Zostaną zainstalowane następujące NOWE pakiety:
  nscd
0 aktualizowanych, 1 nowo instalowanych, 0 usuwanych i 131 nieaktualizowanych.
Konieczne pobranie 291 kB archiwów.
Po tej operacji zostanie dodatkowo użyte 441 kB miejsca na dysku.
0% [Pracuje]^[[S

```

```

root@SRV2:~# grep hosts /etc/nscd.conf
# Currently supported cache names (services): passwd, group, hosts, services
    enable-cache          hosts          yes
    positive-time-to-live hosts          3600
    negative-time-to-live hosts          20
    suggested-size        hosts          211
    check-files           hosts          yes
    persistent            hosts          yes
    shared                hosts          yes
    max-db-size           hosts          33554432
root@SRV2:~# _

```

```

/etc/nscd.conf  [----]  0 L: [ 19+34  53/ 95] *(1630/2717b) 0009 0x009
#<----->paranoia<-----><-----><yes|no>
#<----->restart-interval<-----><time in seconds>
#
#      enable-cache<--><-----><service> <yes|no>
#<----->positive-time-to-live<--><service> <time in seconds>
#<----->negative-time-to-live <service> <time in seconds>
#      suggested-size<--><-----><service> <prime number>
#<----->check-files<--><-----><service> <yes|no>
#<----->persistent<-----><-----><service> <yes|no>
#<----->shared<-----><-----><service> <yes|no>
#<----->NOTE: Setting 'shared' to a value of 'yes' will accelerate the lookups
#<----->      but those lookups will not be counted as cache hits
#<----->      i.e. 'nscd -g' may show '0%'.
#<----->max-db-size<--><-----><service> <number bytes>
#<----->auto-propagate<--><-----><service> <yes|no>
#
# Currently supported cache names (services): passwd, group, hosts, services
#

#<----->logfile<-----><----->/var/log/nscd.log
#<----->threads<-----><----->4
#<----->max-threads<--><----->32
#<----->server-user<--><----->nobody
#<----->stat-user<-----><----->somebody
<----->debug-level<--><----->0
#<----->reload-count<--><----->5
<----->paranoia<-----><----->no
#<----->restart-interval<----->3600

<----->enable-cache<--><----->passwd<--><----->yes
<----->positive-time-to-live<-->passwd<--><----->600
<----->negative-time-to-live<-->passwd<--><----->20
<----->suggested-size<--><----->passwd<--><----->211
<----->check-files<--><----->passwd<--><----->yes

```

Polecenie: nscd -g (status pamięci podręcznej)

```

bufor netgroup:

    tak    bufor włączony
    tak    bufor trwały
    tak    bufor współdzielony
    211     zalecany rozmiar
    216064 całkowity rozmiar puli danych
    0       używany rozmiar puli danych
    28800   sekund czasu przez który będą utrzymywane wpisy pozytywne
    20      sekund czasu przez który będą utrzymywane wpisy negatywne
    0       trafionych wpisów pozytywnych
    0       trafionych wpisów negatywnych
    0       nie trafionych wpisów pozytywnych
    0       nie trafionych wpisów negatywnych
    0%      trafień
    0       aktualnie pamiętanych wartości
    0       maksymalnie pamiętanych wartości
    0       maksymalna długość szukanego łańcucha
    0       opóźnień na rdlock
    0       opóźnień na wrlock
    0       przydzielenie pamięci nie powiodło się
    tak     sprawdzanie zmian w /etc/netgroup
root@SRV2:~# _

```

## Zad 15

Wydajemy polecenie w celu instalacji

```
root@SRV2:~# apt install dnsmasq
Czytanie list pakietów... Gotowe
Budowanie drzewa zależności... Gotowe
Odczyt informacji o stanie... Gotowe
The following additional packages will be installed:
  dnsmasq-base libnetfilter-conntrack3 libnfnetlink0
Sugerowane pakiety:
  resolvconf
Zostaną zainstalowane następujące NOWE pakiety:
  dnsmasq dnsmasq-base libnetfilter-conntrack3 libnfnetlink0
0 aktualizowanych, 4 nowo instalowanych, 0 usuwanych i 131 nieaktualizowanych.
Konieczne pobranie 546 kB archiwów.
Po tej operacji zostanie dodatkowo użyte 1 268 kB miejsca na dysku.
Kontynuować? [T/n]
```

```
/etc/dnsmasq.conf [----] 0 L:[ 1+ 0 1/680] *(0 /27381b) 0035 0x023
# Configuration file for dnsmasq.
#
# Format is one option per line, legal options are the same
# as the long options legal on the command line. See
# "/usr/sbin/dnsmasq --help" or "man 8 dnsmasq" for details.
#
# Listen on this specific port instead of the standard DNS port
# (53). Setting this to zero completely disables DNS function,
# leaving only DHCP and/or TFTP.
#port=5353
#
# The following two options make you a better netizen, since they
# tell dnsmasq to filter out queries which the public DNS cannot
# answer, and which load the servers (especially the root servers)
# unnecessarily. If you have a dial-on-demand link they also stop
# these requests from bringing up the link unnecessarily.
#
# Never forward plain names (without a dot or domain part)
#domain-needed
#
# Never forward addresses in the non-routed address spaces.
#bogus-priv
#
# Uncomment these to enable DNSSEC validation and caching:
# (Requires dnsmasq to be built with DNSSEC option.)
#conf-file=%%PREFIX%%/share/dnsmasq/trust-anchors.conf
#dnssec
#
# Replies which are not DNSSEC signed may be legitimate, because the domain
# is unsigned, or may be forgeries. Setting this option tells dnsmasq to
# check that an unsigned reply is OK, by finding a secure proof that a DS
# record somewhere between the root and the domain does not exist..
# The cost of setting this is that even queries in unsigned domains will need
# one or more extra DNS queries to verify.
#dnssec-check-unsigned
```

```
root@SRV2:~# dig +noall +stats wp.pl
;; Query time: 35 msec
;; SERVER: 192.168.136.176#53(192.168.136.176)
;; WHEN: Wed Nov 27 19:28:02 CET 2024
;; MSG SIZE rcvd: 62

root@SRV2:~# _
```

Sprawdzamy plik konfiguracyjny i wydajemy powyższe polecenie w celu sprawdzenia działania



## Zad 16

Wydajemy poniższe polecenia w celu instalacji i wstępnej konfiguracji. Sprawdzamy zmiany w plikach a następnie działanie narzędzia

```
root@SRV2:~# systemctl enable systemd-resolved.service
Created symlink /etc/systemd/system/dbus-org.freedesktop.resolve1.service → /lib/systemd/systemd-resolved.service.
Created symlink /etc/systemd/system/multi-user.target.wants/systemd-resolved.service → /lib/systemd/systemd-resolved.service.
root@SRV2:~# systemctl start systemd-resolved.service
root@SRV2:~# ln -sf /run/systemd/resolve/stub-resolv.conf /etc/resolv.conf
root@SRV2:~# systemctl status systemd-resolved.service
● systemd-resolved.service - Network Name Resolution
   Loaded: loaded (/lib/systemd/system/systemd-resolved.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-11-27 17:49:29 CET; 1min 30s ago
     Docs: man:systemd-resolved.service(8)
           man:org.freedesktop.resolve1(5)
           https://www.freedesktop.org/wiki/Software/systemd/writing-network-configuration-manage
           https://www.freedesktop.org/wiki/Software/systemd/writing-resolver-clients
   Main PID: 1030 (systemd-resolve)
     Status: "Processing requests..."
    Tasks: 1 (limit: 4880)
   Memory: 4.8M
      CPU: 247ms
   CGroup: /system.slice/systemd-resolved.service
           └─1030 /lib/systemd/systemd-resolved

Nov 27 17:49:28 SRV2 systemd[1]: Starting Network Name Resolution...
Nov 27 17:49:28 SRV2 systemd-resolved[1030]: Positive Trust Anchors:
Nov 27 17:49:28 SRV2 systemd-resolved[1030]: . IN DS 20326 8 2 e06d44b80b8f1d39a95c0b0d7c65d08458e8
Nov 27 17:49:28 SRV2 systemd-resolved[1030]: Negative trust anchors: 10.in-addr.arpa 16.172.in-addr
Nov 27 17:49:28 SRV2 systemd-resolved[1030]: Using system hostname 'SRV2'.
Nov 27 17:49:29 SRV2 systemd[1]: Started Network Name Resolution.
lines 1-21/21 (END)
```

```

/etc/resolv.conf  [----] 26 L:[ 1+ 0  1/ 20] *(26 / 738b) 0109 0x06D
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs should typically not access this file directly, but only
# through the symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a
# different way, replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 127.0.0.53
options edns0 trust-ad
search .

```

```

/etc/systemd/resolved.conf  [----] 5 L:[ 1+18 19/ 31] *(760 / 943b) 0010 0x00A
# This file is part of systemd.
#
# systemd is free software; you can redistribute it and/or modify it
# under the terms of the GNU Lesser General Public License as published by
# the Free Software Foundation; either version 2.1 of the License, or
# (at your option) any later version.
#
# Entries in this file show the compile time defaults.
# You can change settings by editing this file.
# Defaults can be restored by simply deleting this file.
#
# See resolved.conf(5) for details

[Resolve]
# Some examples of DNS servers which may be used for DNS= and FallbackDNS=:
# Cloudflare: 1.1.1.1 1.0.0.1 2606:4700:4700::1111 2606:4700:4700::1001
# Google:     8.8.8.8 8.8.4.4 2001:4860:4860::8888 2001:4860:4860::8844
# Quad9:      9.9.9.9 2620:fe::fe
#DNS=
#FallbackDNS=
#Domains=
#DNSSEC=no
#DNSOverTLS=no
#MulticastDNS=yes
#LLMNR=yes
#Cache=yes
#DNSStubListener=yes
#DNSStubListenerExtra=
#ReadEtcHosts=yes
#ResolveUnicastSingleLabel=no

```

```

root@SRV1:~# ping -4 -c 2 wp.pl
PING wp.pl (212.77.98.9) 56(84) bytes of data.
64 bytes from www.wp.pl (212.77.98.9): icmp_seq=1 ttl=53 time=28.2 ms
64 bytes from www.wp.pl (212.77.98.9): icmp_seq=2 ttl=53 time=23.1 ms

--- wp.pl ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1132ms
rtt min/avg/max/mdev = 23.114/25.633/28.152/2.519 ms
root@SRV1:~# resolvectl status
Global
    Protocols: +LLMNR +mDNS -DNSOverTLS DNSSEC=no/unsupported
    resolv.conf mode: stub
Current DNS Server: 192.168.136.205
    DNS Servers: 192.168.136.205

Link 2 (enp0s3)
Current Scopes: LLNMR/IPv4 LLNMR/IPv6
    Protocols: -DefaultRoute +LLMNR -mDNS -DNSOverTLS DNSSEC=no/unsupported
root@SRV1:~# resolvectl statistics
DNSSEC supported by current servers: no

Transactions
Current Transactions: 0
    Total Transactions: 29

Cache
    Current Cache Size: 2
    Cache Hits: 11
    Cache Misses: 21

DNSSEC Verdicts
    Secure: 0
    Insecure: 0
    Bogus: 0
    Indeterminate: 0
root@SRV1:~#

```

## Zad 17

Pobieramy narzędzie i sprawdzamy nowoutworzony plik, następnie sprawdzamy działanie

```

root@SRV2:~# apt install dnscrypt-proxy
Czytanie list pakietów... Gotowe
Budowanie drzewa zależności... Gotowe
Odczyt informacji o stanie... Gotowe
Sugerowane pakiety:
  resolvconf
Zostaną zainstalowane następujące NOWE pakiety:
  dnscrypt-proxy
0 aktualizowanych, 1 nowo instalowanych, 0 usuwanych i 131 nieaktualizowanych.
Konieczne pobranie 2 769 kB archiwów.
Po tej operacji zostanie dodatkowo użyte 9 611 kB miejsca na dysku.
Pobieranie:1 http://ftp.pl.debian.org/debian bullseye/main amd64 dnscrypt-proxy amd64 2.0.45+ds1-1+b5 [2 769 kB]
Pobrano 2 769 kB w 2s (1 547 kB/s)
Wybieranie wcześniej niewybranego pakietu dnscrypt-proxy.
(Odczytywanie bazy danych ... 31030 plików i katalogów obecnie zainstalowanych.)
Przygotowywanie do rozpakowania pakietu .../dnscrypt-proxy_2.0.45+ds1-1+b5_amd64.deb ...
Rozpakowywanie pakietu dnscrypt-proxy (2.0.45+ds1-1+b5) ...
Konfigurowanie pakietu dnscrypt-proxy (2.0.45+ds1-1+b5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/dnscrypt-proxy-resolvconf.service → /lib/systemd/system/dnscrypt-proxy-resolvconf.service.
Created symlink /etc/systemd/system/sockets.target.wants/dnscrypt-proxy.socket → /lib/systemd/system/dnscrypt-proxy.socket.
Created symlink /etc/systemd/system/multi-user.target.wants/dnscrypt-proxy.service → /lib/systemd/system/dnscrypt-proxy.service.
root@SRV2:~#

```

```

/etc/dnscrypt-proxy/dnscrypt-proxy.toml  [----]  0 L: [ 1+ 0  1/ 18] *(0 / 515b
# Empty listen_addresses to use systemd socket activation
listen_addresses = []
server_names = ['cloudflare']

[query_log]
  file = '/var/log/dnscrypt-proxy/query.log'

[nx_log]
  file = '/var/log/dnscrypt-proxy/nx.log'

[sources]
  [sources,'public-resolvers']
    url = 'https://download.dnscrypt.info/resolvers-list/v2/public-resolvers.md'
    cache_file = '/var/cache/dnscrypt-proxy/public-resolvers.md'
    minisign_key = 'RWQf6LRCGA9i53m1Yec04IzT51TGpPvWucNSCh1CBM0QTaLn73Y7GF03'
    refresh_delay = 72
    prefix = ''

```

```

root@SRV2:~# dig +noall +stats gmail.com
;; connection timed out; no servers could be reached

root@SRV2:~# dig +noall +stats gmail.com
;; Query time: 4851 msec
;; SERVER: 192.168.136.176#53(192.168.136.176)
;; WHEN: Wed Nov 27 17:29:11 CET 2024
;; MSG SIZE rcvd: 66

root@SRV2:~# _

```