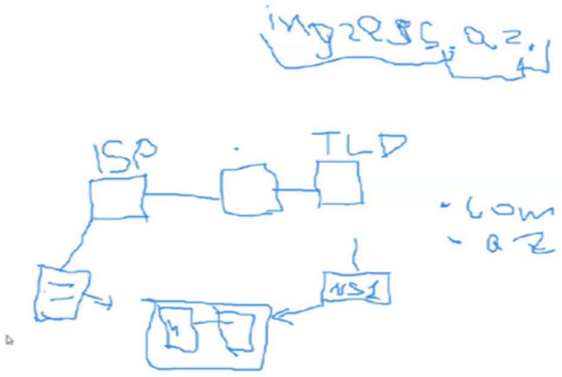
DNS

DNS nə üçündür? Biz browserdə saytlara girmək üçün İP yazmalıyıq. Amma IP çox uzun olduğu üçün onu yadda saxlamaq olmur. Çünki rəqəmlər yadda saxlamaq çətindir. Buna görədə biz DNS istifadə edirik. DNS IP-ni ada, adıda IP-yə resolv edir. DNS necə işləyir?

1. İlk olaraq browser-in cache-nə baxır. (TTL vaxtı qədər cache-də qalır.)
2. Daha sonra local host faylına baxır.
3. OS səviyyəsində cache baxır.
4. DNS server varsa ona baxır.
5. Daha sonra ISP-yə baxır.
6. 13 root DNS server-ə baxır. (Burada Top-Level-Domain məlumatlarını öyrənir.)
7. Name Server-ə yönləndirilir.



Biz burada Name Server-in Public IP-sini Domain aldığımız sayta qeyd edirik. Təhlükəsizlik üçün master Name Server qurulur. Və bu global-a çıxarılmır. Bunun yerinə Slave Name Server qurulur, və global-a çıxarılır.

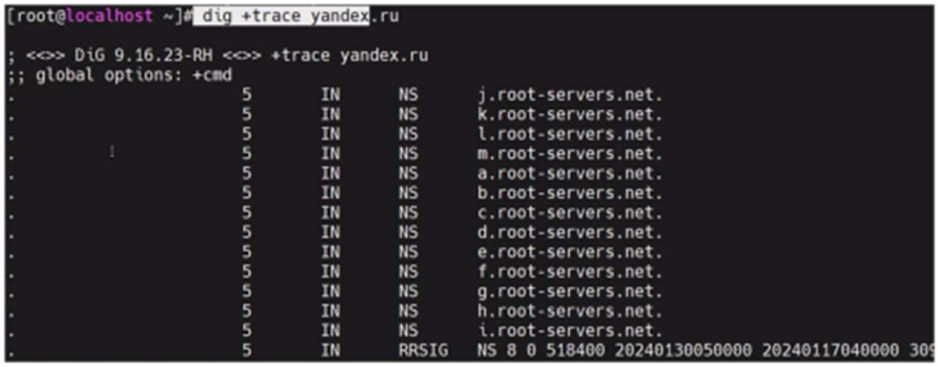
#nslookup google.com

```
[root@localhost ~]# nslookup google.com
Server:         192.168.149.2
Address:        192.168.149.2#53

Non-authoritative answer:
Name:   google.com
Address: 142.251.140.14
Name:   google.com
Address: 2a00:1450:4017:813::200e
```

dig yandex.ru

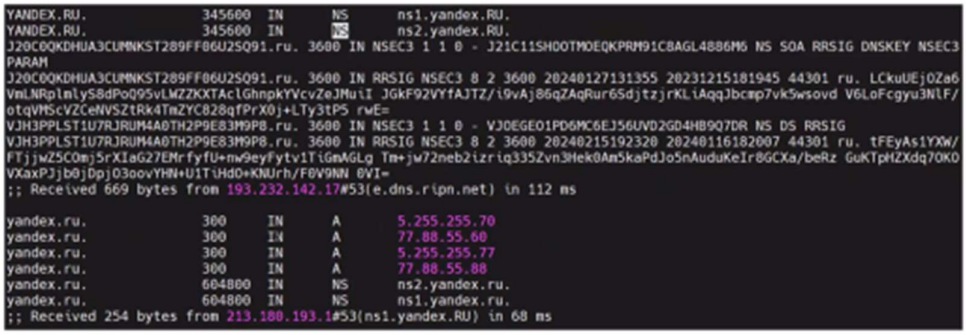
```
[root@localhost ~]# dig yandex.ru

; <<>> DiG 9.16.23-RH <<>> yandex.ru
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41581
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; MBZ: 0x0005, udp: 1232
;; QUESTION SECTION:
;yandex.ru.                     IN      A

;; ANSWER SECTION:
yandex.ru.              5       IN      A       5.255.255.70
yandex.ru.              5       IN      A       5.255.255.77
yandex.ru.              5       IN      A       77.88.55.88
yandex.ru.              5       IN      A       77.88.55.60

;; Query time: 8 msec
;; SERVER: 192.168.149.2#53(192.168.149.2)
;; WHEN: Wed Jan 17 20:36:29 +04 2024
;; MSG SIZE  rcvd: 102
```

dig +trace yandex.ru



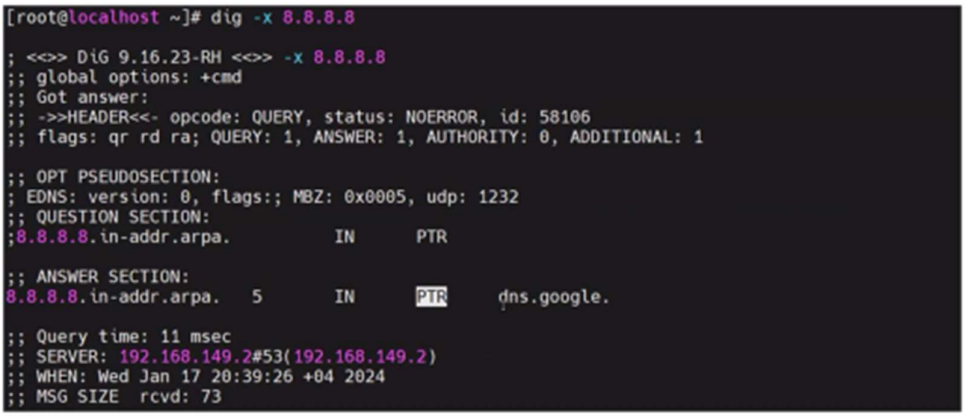
```
[root@localhost ~]# dig +trace yandex.ru

; <<>> DiG 9.16.23-RH <<>> +trace yandex.ru
;; global options: +cmd
.                       5       IN      NS      j.root-servers.net.
.                       5       IN      NS      k.root-servers.net.
.                       5       IN      NS      l.root-servers.net.
.                       5       IN      NS      m.root-servers.net.
.                       5       IN      NS      a.root-servers.net.
.                       5       IN      NS      b.root-servers.net.
.                       5       IN      NS      c.root-servers.net.
.                       5       IN      NS      d.root-servers.net.
.                       5       IN      NS      e.root-servers.net.
.                       5       IN      NS      f.root-servers.net.
.                       5       IN      NS      g.root-servers.net.
.                       5       IN      NS      h.root-servers.net.
.                       5       IN      NS      i.root-servers.net.
.                       5       IN      RRSIG   NS 8 0 518400 20240130050000 20240117040000 309
```

```
ru.                     172800  IN      NS      a.dns.ripn.net.
ru.                     172800  IN      NS      f.dns.ripn.net.
ru.                     172800  IN      NS      b.dns.ripn.net.
ru.                     172800  IN      NS      d.dns.ripn.net.
ru.                     172800  IN      NS      e.dns.ripn.net.
ru.                     86400   IN      DS      18274 8 2 AB35D17D3F39EB42CEE14C6273247938D33EEEAA9F5CAA70B3858D8F 4B
D3E87B
ru.                     86400   IN      RRSIG   DS 8 1 86400 20240130050000 20240117040000 30903 . 3cdreVVXGcD3coCwbY
```



```
YANDEX.RU.              345600  IN      NS      ns1.yandex.RU.
YANDEX.RU.              345600  IN      NS      ns2.yandex.RU.
J20C0QKDHUA3CUMNKST289FF06U2SQ91.ru. 3600 IN NSEC3 1 1 0 - J21C11SHDOTMOEQKPRM91C8AGL4886M6 NS SOA RRSIG DNSKEY NSEC3
PARAM
J20C0QKDHUA3CUMNKST289FF06U2SQ91.ru. 3600 IN RRSIG NSEC3 8 2 3600 20240127131355 20231215181945 44301 ru. LCkuUEjOZa6
VmLNRplmlyS8dPoQ9SvLWZZKXTAclGhnpkYVcvZeJMuiI JGkF92VYfAJTZ/i9vAj86qZAqRur6SdjtzjrKLiAqqJbcmp7vk5wsovd V6LoFcgyu3NlF/
otqVMScVZCeNVSZtRk4TmZYC828qfPrX0j+LTy3tP5 rwE=
VJH3PPLST1U7RJRUM4A0TH2P9E83M9P8.ru. 3600 IN NSEC3 1 1 0 - VJOEGEO1PD6MC6EJ56UVD2GD4HB9Q7DR NS DS RRSIG
VJH3PPLST1U7RJRUM4A0TH2P9E83M9P8.ru. 3600 IN RRSIG NSEC3 8 2 3600 20240215192320 20240116182007 44301 ru. tFEyAs1YXW/
FTjjwZ5COmj5rXIaG27EMrfyfU+nw9eyFytv1TiGmAGLg Tm+jw72neb2izriq335Zvn3Hek0Am5kaPdJo5nAuduKeIr8GCXa/beRz GuKTpHZXdq7OKO
VXaxPJjb0jDpjO3oovYHN+U1TiHdO+KNUrh/F0V9NN 0VI=
;; Received 669 bytes from 193.232.142.17#53(e.dns.ripn.net) in 112 ms

yandex.ru.              300     IN      A       5.255.255.70
yandex.ru.              300     IN      A       77.88.55.60
yandex.ru.              300     IN      A       5.255.255.77
yandex.ru.              300     IN      A       77.88.55.88
yandex.ru.              604800  IN      NS      ns2.yandex.ru.
yandex.ru.              604800  IN      NS      ns1.yandex.ru.
;; Received 254 bytes from 213.180.193.1#53(ns1.yandex.RU) in 68 ms
```

dig -x 8.8.8.8



```
[root@localhost ~]# dig -x 8.8.8.8

; <<>> DiG 9.16.23-RH <<>> -x 8.8.8.8
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 58106
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; MBZ: 0x0005, udp: 1232
;; QUESTION SECTION:
;8.8.8.8.in-addr.arpa.          IN      PTR

;; ANSWER SECTION:
8.8.8.8.in-addr.arpa.   5       IN      PTR     dns.google.

;; Query time: 11 msec
;; SERVER: 192.168.149.2#53(192.168.149.2)
;; WHEN: Wed Jan 17 20:39:26 +04 2024
;; MSG SIZE  rcvd: 73
```

Install DNS (BIND)

yum -y install bind bind-utils
firewall-cmd --add-service=dns --permanent;firewall-cmd --reload

systemctl status named (distroya görə dəyişkənlik göstərir)

Configure DNS (BIND)

vim /etc/named.conf

listen-on port 53 { 127.0.0.1; 192.168.149.129; };
allow-query { localhost; any; };
(Allow-query kimlərdən gələcək olan requestləri resolve edəcəyini göstərir. Any yazıldığı üçün istənilən hostdan gələn request resolve ediləcək.*)*

Recursion – Əgər no olarsa, "məndə əgər A recordu varsa cavab qaytar, əgər yoxdusa ilişib qalır". Əgər yes olarsa DNS flow recursion sayılır. Forwarder – Əgər məndə yoxdursa təyin olunmuş server-ə gedir. Məsələn 8.8.8.8 .

```
        recursion yes;
```

Create Forward Zones

zone "ingress.local" IN {

type master;

file "/var/named/fwd.ingress.local.db";

allow-update { none; };

```
zone "ingress.local." IN {
        type master;
        file "ingress-forward.local.db";
        allow-update {none;};
};
```

Servisin check olunması üçün istifadə edilir

```
[root@localhost ~]# named-checkconf
```

Ingress.local. domain-ə aid ingress-forward.local.db zone-sini kontrol elə.

```
[root@localhost named]# named-checkzone ingress.local. ingress-forward.local.db
zone ingress.local/IN: loaded serial 0
OK
```

Create Forward Zone Files

vim /var/named/fwd.ingress.local.db

$TTL 3H
@ IN SOA @ ingress.local. (
0 ; serial
1D ; refresh
1H ; retry
1W ; expire
3H) ; minimum
NS @
A 127.0.0.1
AAAA ::1
@ IN NS node01.ingress.local.

node01 IN A 10.55.8.21
node02 IN A 10.55.8.22
node07 IN CNAME node02.ingress.local.
mail IN A 10.55.8.23
@ IN MX 10 mail.ingress.local

```
$TTL 3H
@       IN SOA  @ ingress.local. (
                                        00      ; serial
                                        1D      ; refresh
                                        1H      ; retry
                                        1W      ; expire
                                        3H )    ; minimum
        NS      @
        A       127.0.0.1
        AAAA    ::1
master IN       A       192.168.149.129
slave IN        A       192.168.149.135
test IN         A       192.168.149.192
```

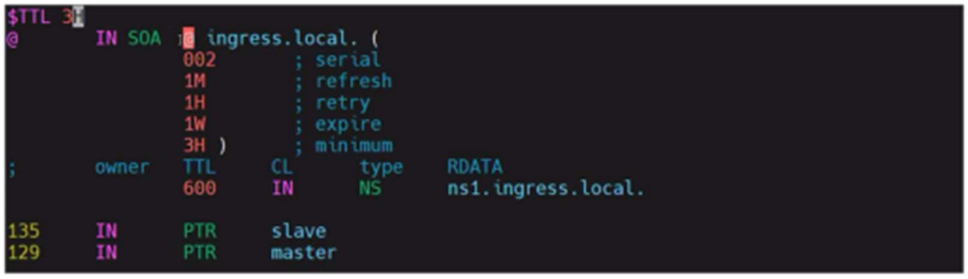
```
[root@localhost named]# nslookup test.ingress.local
Server:         192.168.149.129
Address:        192.168.149.129#53

Name:   test.ingress.local
Address: 192.168.149.192
```

Create Reverse Zone

```
zone "149.168.192.in-addr.arpa"
IN {
type master;
file "192.168.149.zone";
forwarders {};
};
```

Create Reverse Zone Files

```
$TTL 3H
@ IN SOA @ ingress.local. (
2 ; serial
1M ; refresh
1H ; retry
1W ; expire
3H ) ; minimum
; owner TTL CL type
RDATA
600 IN NS
ns1.ingress.local.
131 IN PTR
master.ingress.local.
132 IN PTR
mailserver.ingress.local.
130.8.55.10.in-addr.arpa. IN
PTR slave.ingress.local.
134 IN PTR
server2.ingress.local.
```



Slave configuration

allow-transfer { localhost; 192.168.149.129; }; ***add to master BIND***
yum -y install bind bind-utils
firewall-cmd --add-service=dns --permanent;firewall-cmd –reload

zone "ingress.az" IN {
type slave;
file "/var/named/fwd.ingress.az.db";
masters { 10.55.8.24; };
masterfile-format text;

```
zone "ingress.local." IN {
        type slave;
        file "ingress.local.db";
        masters { 192.168.149.129; };
        masterfile-format text;
};
```

zone "8.55.10.in-addr.arpa" IN {
type slave;
file "10.5..8.zone";
masters {10.55.8.22; };
masterfile-format text;

```
zone "149.168.192.in-addr.arpa." IN {
        type slave;
        file "192.168.149.zone";
        masters {192.168.149.129; };
        masterfile-format text;
};
```

- **Primary Name Server** – The nameserver that contains the original zone file and not an AXFR transferred copy.
- **Hostmaster Email** – Address of the party responsible for the zone. A period "." is used in place of an "@" symbol. For email addresses that contain a period, this will be escaped with a slash "/".
- **Serial Number** – Version number of the zone. As you make changes to your zone file, the serial number will increase.
- **Time To Refresh** – How long in seconds a nameserver should wait prior to checking for a Serial Number increase within the primary zone file. An increased Serial Number means a transfer is needed to sync your records. Only applies to zones using secondary DNS.
- **Time To Retry** – How long in seconds a nameserver should wait prior to retrying to update a zone after a failed attempt. Only applies to zones using secondary DNS.
- **Time To Expire** – How long in seconds a nameserver should wait prior to considering data from a secondary zone invalid and stop answering queries for that zone. Only applies to zones using secondary DNS.
- **Minimum TTL** – How long in seconds that a nameserver or resolver should cache a negative response.