A) Verfing the DNS resolution

1. **Checking the current DNS resolver**
   I want to know what DNS server(s) the system is configured to use when resolving domain names.

```
ubuntu:~$ cat /etc/resolv.conf
# This is /run/systemd/resolve/resolv.conf managed by man:systemd-resolved(8).
# Do not edit.
#
# This file might be symlinked as /etc/resolv.conf. If you're looking at
# /etc/resolv.conf and seeing this text, you have followed the symlink.
#
# This is a dynamic resolv.conf file for connecting local clients directly to
# all known uplink DNS servers. This file lists all configured search domains.
#
# 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 8.8.8.8
nameserver 1.1.1.1
search .
ubuntu:~$
```

2. Check if internal.example.com can be resolved using the system's DNS

```
ubuntu:~$ dig internal.example.com

; <<>> DiG 9.18.30-0ubuntu0.24.04.1-Ubuntu <<>> internal.example.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 32035
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;internal.example.com.          IN      A

;; AUTHORITY SECTION:
example.com.           1800    IN      SOA     ns.icann.org. noc.dns.icann.org. 2025011625 7200 3600 1209600 3600

;; Query time: 107 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Sun Apr 27 23:25:13 UTC 2025
;; MSG SIZE  rcvd: 105
```

If this fails, it shows **the local resolver** can't find the domain required

3. Test if public DNS (Google 8.8.8.8) can resolve internal.example.com

- Helps isolate if the problem is **local** or **global**.
- If Google's 8.8.8.8 can't resolve it either, then the domain is likely internal-only and **needs internal DNS working properly**.

```
ubuntu:~$ dig @8.8.8.8 internal.example.com

; <<>> DiG 9.18.30-0ubuntu0.24.04.1-Ubuntu <<>> @8.8.8.8 internal.example.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 12127
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;internal.example.com.          IN      A

;; AUTHORITY SECTION:
example.com.            1800    IN      SOA     ns.icann.org. noc.dns.icann.org. 2025011625 7200 3600 1209600 3600

;; Query time: 106 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Sun Apr 27 23:34:17 UTC 2025
;; MSG SIZE  rcvd: 105
```

B) Diagnose Service Reachability

1. Try to reach the web server directly via IP

```
ubuntu:~$ curl -I http://192.168.50.10
```

no response

2. Check if TCP port 80 (HTTP) is open and listening

```
ubuntu:~$ telnet 192.168.50.10 80
Trying 192.168.50.10...
```

(No response)

Add the missing A record on the DNS server.

```
ubuntu:~$ sudo vim /etc/bind/zones/db.internal.example.com
ubuntu:~$
```

Bypass DNS temporarily using /etc/hosts

this is a Quick way to test if **service itself is OK** without fixing DNS first.

```
ubuntu:~$ vim etc/hosts
```

```
127.0.0.1 localhost

# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
127.0.0.1 ubuntu
127.0.0.1 host01
192.168.50.10 internal.example.com
~
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```