1. Verify DNS Resolution

Used dig internal.example.com and dig @8.8.8.8 internal.example.com

Observed the DNS response (internal DNS failed / 8.8.8.8 worked / etc.)

```
ahmedkhamis@DESKTOP-ME888PM:~$ dig internal.example.com

; <<>> DiG 9.18.30-0ubuntu0.22.04.2-Ubuntu <<>> internal.example.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 23256
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
;internal.example.com.          IN      A

;; AUTHORITY SECTION:
example.com.            1726    IN      SOA     ns.icann.org. noc.dns.icann.org. 2025011626 7200 3600 1209600 3600

;; Query time: 50 msec
;; SERVER: 172.20.240.1#53(172.20.240.1) (UDP)
;; WHEN: Mon Apr 28 21:09:54 EEST 2025
;; MSG SIZE  rcvd: 94

ahmedkhamis@DESKTOP-ME888PM:~$ dig @8.8.8.8 internal.example.com

; <<>> DiG 9.18.30-0ubuntu0.22.04.2-Ubuntu <<>> @8.8.8.8 internal.example.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 53439
;; 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.            1450    IN      SOA     ns.icann.org. noc.dns.icann.org. 2025011626 7200 3600 1209600 3600

;; Query time: 70 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Mon Apr 28 21:10:04 EEST 2025
;; MSG SIZE  rcvd: 105

ahmedkhamis@DESKTOP-ME888PM:~$
```

2. Diagnose Service Reachability

Used curl -I http:// 172.20.240.1and/or telnet <IP> 80

Confirmed if the service is reachable

```
ahmedkhamis@DESKTOP-ME888PM:~$ telnet 172.20.240.1 80
Trying 172.20.240.1...
```

```
ahmedkhamis@DESKTOP-ME888PM:~$ curl -I http://172.20.240.1
```

3. Check Local Service Listening

Used ss -tulnp | grep :80\|:443

Confirmed if the service is actually running and listening

```
ahmedkhamis@DESKTOP-ME888PM:~$ ss -tulnp | grep ':80\|:443'
tcp   LISTEN 0      511          0.0.0.0:80         0.0.0.0:*
tcp   LISTEN 0      4096         0.0.0.0:8081       0.0.0.0:*
tcp   LISTEN 0      511             [::]:80            [::]:*
tcp   LISTEN 0      4096            [::]:8081          [::]:*
ahmedkhamis@DESKTOP-ME888PM:~$
```

4. Check Firewall Settings

Ran sudo ufw status

Verified if ports 80/443 are allowed

```
ahmedkhamis@DESKTOP-ME888PM:~$ sudo ufw status
[sudo] password for ahmedkhamis:
Status: active

To                         Action      From
--                         ------      ----
80/tcp                     ALLOW       Anywhere
80/tcp (v6)                ALLOW       Anywhere (v6)
```

5. Temporary Hosts File Fix

Edited /etc/hosts and added IP mapping manually

```
172.20.240.1    internal.example.com
# The following lines are desirable for IPv6 capable hosts
```

6. Make DNS Change Permanent

Edited /etc/systemd/resolved.conf

Added DNS=8.8.8.8 8.8.4.4 and FallbackDNS=1.1.1.1

Restarted systemd-resolved service