

# Step-by-Step Guide: Setting Up DNS-Layer Security Using Google Cloud and No-IP

## Step 1: Create a Free Subdomain on No-IP

1. **Sign Up for No-IP:**
  - Go to [No-IP](#).
  - Click on `Sign Up` and create a free account by filling in the required details.
2. **Create a Free Subdomain:**
  - Once logged in, go to the `Dynamic DNS` section.
  - Click `Create Hostname`.
  - Choose a hostname (e.g., `urldetection`).
  - Select a free domain from the provided options (e.g., `ddns.net`).
  - Set the hostname type to `DNS Host (A)` and enter the IP address of your Google Cloud VM (you can leave this blank for now if you haven't set up the VM yet).
  - Click `Create Hostname`.

## Step 2: Set Up a Google Cloud VM

1. **Create a VM Instance:**
  - Sign in to Google Cloud Console.
  - Navigate to `Compute Engine > VM Instances`.
  - Click `Create Instance`.
  - Configure the instance with:
    - Name: `dns-vm-instance`
    - Region: Select a region close to your location.
    - Machine type: Choose `e2-micro` (sufficient for a DNS server).
    - Boot disk: Use the default settings (Debian/Ubuntu).
  - Click `Create`.
2. **Note the External IP Address:**
  - After the VM is created, note the external IP address assigned to your VM.

## Step 3: Install and Configure BIND9 on Your VM

1. **SSH into Your VM:**
  - In the Google Cloud Console, click `SSH` next to your VM instance to open a terminal window.
2. **Install BIND9:**
  - Update package lists and install BIND9:

```
sudo apt-get update
sudo apt-get install bind9 bind9utils bind9-doc -y
```

3. **Configure BIND9:**
  - Edit `named.conf.local` to add your zone configuration:

```
sudo nano /etc/bind/named.conf.local
```

Add the following:

```
zone "urldetection.ddns.net" {
    type master;
    file "/etc/bind/db.urldetection.ddns.net";
};
```

- o Edit named.conf.options to configure options:

```
sh
Copy code
sudo nano /etc/bind/named.conf.options
```

Update the file to look like this:

```
options {
    directory "/var/cache/bind";

    forwarders {
        8.8.8.8;
        8.8.4.4;
    };

    auth-nxdomain no;      # conform to RFC1035
    listen-on { any; };
    listen-on-v6 { none; };
};
```

- o Create and edit the zone file for your domain:

```
sudo cp /etc/bind/db.local /etc/bind/db.urldetection.ddns.net
sudo nano /etc/bind/db.urldetection.ddns.net
```

Update the file to look like this:

```
sh
Copy code
;
; BIND data file for local loopback interface
;
$TTL      604800
@         IN      SOA      ns1.urldetection.ddns.net.
admin.urldetection.ddns.net. (
                        2      ; Serial
                        604800 ; Refresh
                        86400  ; Retry
                        2419200 ; Expire
                        604800 ) ; Negative Cache TTL
;
@         IN      NS       ns1.urldetection.ddns.net.
@         IN      A        35.198.184.159
ns1       IN      A        35.198.184.159
www       IN      A        35.198.184.159
```

#### 4. Restart BIND9:

- o Restart the BIND9 service to apply the changes:

```
sudo systemctl restart bind9
sudo systemctl enable bind9
```

## Step 4: Configure Firewall Rules on Google Cloud

### 1. Set Up Firewall Rules:

- Go to VPC Network > Firewall in the Google Cloud Console.
- Click Create Firewall Rule.
- Configure the rule as follows:
  - Name: allow-dns
  - Network: default (or your custom network)
  - Targets: All instances in the network
  - Source IP ranges: 0.0.0.0/0
  - Protocols and ports: Specified protocols and ports, tcp:53, udp:53
- Click Create.

## Step 5: Verify DNS Functionality

### 1. Install `dnsutils`:

- Install the `dnsutils` package to use the `dig` command:

```
sudo apt-get install dnsutils -y
```

### 2. Test DNS Resolution:

- Use the `dig` command to verify that your DNS server is correctly resolving the domain:

```
dig @35.198.184.159 url detection.ddns.net
```

- Expected output:

```
; <<>> DiG 9.18.24-1-Debian <<>> @35.198.184.159
url detection.ddns.net
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 32978
;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 0,
ADDITIONAL: 1
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: f78e9a353b0637120100000066715f836320e4918d40347d
(good)
;; QUESTION SECTION:
;url detection.ddns.net.          IN      A

;; ANSWER SECTION:
url detection.ddns.net.  604800  IN      A      35.198.184.159

;; Query time: 0 msec
;; SERVER: 35.198.184.159#53(35.198.184.159) (UDP)
;; WHEN: Tue Jun 18 10:20:51 UTC 2024
;; MSG SIZE rcvd: 94
```

## **Summary**

By following these steps, you have successfully set up a DNS server on Google Cloud using BIND9 and a free subdomain from No-IP. You have configured the DNS server to resolve a custom domain and verified its functionality. If you need further assistance with additional configurations or functionalities, feel free to ask!