

# 4: Traefik - Reverse Proxy (essential)

Now that your infrastructure is ready, it's time to install Traefik - the most important service you'll set up. Traefik handles secure connections and routing for all your other applications.

## What is Traefik? (Simple Explanation)

**Traefik** is like a smart traffic director for your server. Think of it as a receptionist at a large office building who:

- Greets visitors (web traffic) at the front door
- Checks their ID (verifies security certificates)
- Directs them to the right office (routes traffic to the correct application)
- Makes sure they use the secure elevator (forces HTTPS)

### Why Traefik is essential:

- **Automatic SSL certificates** - Makes your websites secure (HTTPS)
- **Domain routing** - Directs traffic to the right application
- **Security** - Protects your applications from direct internet access
- **Required by other apps** - Most Infinity Tools applications need Traefik

## Why Install Traefik First?

Traefik should be installed before any other application because:

- **Other apps depend on it** - Many applications will ask if you want to use Traefik
- **SSL certificates** - It handles secure connections for all your services
- **Domain management** - It routes traffic based on your domain names
- **Security foundation** - It provides a secure gateway to your applications

**Without Traefik:** You'd have to manually configure SSL certificates and routing for each application - a complex and time-consuming process.

## What You'll Need

Before installing Traefik, make sure you have:

- **Docker installed** (from Chapter 3)
- **Docker network set up** (from Chapter 3)
- **A domain name** (optional but recommended)
- **An email address** (for SSL certificate notifications)

## About Domain Names

**What is a domain name?** It's like your website's address (e.g., `mywebsite.com`).

**Why you need one:** Traefik uses your domain name to create SSL certificates and route traffic. Without one, you can still use Traefik, but you'll get security warnings in your browser.

**Examples of domain names:**

- `myinfinitytools.com`
- `myserver.example.com`
- `home.mydomain.net`

**Don't have a domain?** That's okay! You can still install Traefik and add a domain later, or use your server's IP address directly.

## Step 1: Start Infinity Tools

Make sure you're connected to your server via SSH, then start Infinity Tools:

```
sudo infinity-tools
```

## Step 2: Navigate to Traefik Installation

In the Infinity Tools menu, you'll see several sections. Look for:

- **SECURITY & NETWORKING** - This is where Traefik is located

Use your arrow keys to navigate to this section and press Enter.

## Using the Infinity Tools GUI

The Infinity Tools interface makes everything easy to find and use:

- **Color-coded sections** - Each category has its own color
- **Clear descriptions** - Hover over options to see what they do
- **Status indicators** - Shows if services are running or stopped
- **Progress bars** - Shows installation progress in real-time

**Look for the turquoise cursor** - it shows exactly what you're about to select!

## Step 3: Install Traefik

In the Security & Networking menu, you'll see:

- **Install Traefik** - This is what you want

Select "Install Traefik" and press Enter.

## What Happens During Installation

Traefik installation will:

- Create a configuration file
- Set up SSL certificate management
- Create a Docker container
- Configure the reverse proxy
- Start the service

**This usually takes 1-2 minutes.**

## Step 4: Configure Traefik

During installation, you'll be asked a few questions:

### Email Address for SSL Certificates

You'll see a prompt like:

```
Enter email address for SSL certificates:  
[admin@example.com]
```

**What to enter:** Use a valid email address you check regularly. This is used for SSL certificate notifications and warnings.

## Examples:

- `admin@myinfinitytools.com`
- `your-email@gmail.com`
- `notifications@yourdomain.com`

## Domain Name (Optional)

If you have a domain name, you'll be asked:

```
Enter your domain name (or press Enter to skip):  
[myinfinitytools.com]
```

**If you have a domain:** Enter it here (e.g., `myinfinitytools.com`)

**If you don't have a domain:** Press Enter to skip - you can add this later

## IPv6 Configuration

You might be asked about IPv6 support:

```
Do you want to enable IPv6 support?  
Y) Yes - Enable both IPv4 and IPv6  
N) No - IPv4 only (recommended for beginners)
```

**For beginners:** Choose "N" (No) - IPv4 only is simpler and works fine for most use cases.

## Step 5: Wait for Installation

After answering the questions, Traefik will install and start. You'll see messages like:

```
██Installing Traefik...  
██Creating configuration...  
██Starting Traefik container...  
█ Traefik installed successfully!
```

## Step 6: Verify Traefik is Working

After installation completes, let's make sure Traefik is running properly.

# Check Traefik Status

In the Infinity Tools menu, go to:

- **☰ STATUS & HEALTH → STATUS**

You should see Traefik listed as "RUNNING" or "ACTIVE".

## Using the Status Dashboard

The Status & Health section gives you a complete overview of your system:

- **☑ Service Status** - Shows which applications are running
- **☑ System Health** - CPU, memory, and disk usage
- **☑ Docker Info** - All your containers and their status
- **☑ Network Status** - Shows your Docker networks

**Look for the green checkmarks** - they indicate everything is working properly!

## Check Docker Containers

You can also check by going to:

- **☰ STATUS & HEALTH → DOCKER INFO**

Look for a container named "traefik" - it should be running.

## Understanding the Docker Info Screen

The Docker Info section shows you:

- **☑ Container Name** - What the container is called
- **☑ Status** - Running, stopped, or restarting
- **☑ Ports** - Which ports the container is using
- **☑ Memory Usage** - How much RAM it's using

**Green status means everything is working!** Red or yellow means there might be an issue.

## Step 7: Understanding What Was Created

Traefik installation creates several important files and configurations:

## Configuration Files

Traefik stores its configuration in:

- `/opt/speedbits/traefik/traefik.yml` - Main configuration
- `/opt/speedbits/traefik/docker-compose.yml` - Docker setup

## SSL Certificates

SSL certificates are stored in:

- `/opt/speedbits/traefik/letsencrypt/` - Let's Encrypt certificates

## Docker Container

Traefik runs as a Docker container that:

- Listens on ports 80 (HTTP) and 443 (HTTPS)
- Automatically redirects HTTP to HTTPS
- Manages SSL certificates
- Routes traffic to your applications

## Step 8: Test Traefik (If You Have a Domain)

If you configured a domain name, you can test Traefik by visiting your domain in a web browser.

### What You Should See

When you visit your domain, you should see:

- A secure connection (HTTPS) - look for the lock icon in your browser
- Either a "404 Not Found" page (normal - no apps installed yet) or a Traefik dashboard

### If You Don't Have a Domain

You can still test Traefik by visiting your server's IP address:

- Visit `http://YOUR_SERVER_IP` in your browser
- It should redirect to `https://YOUR_SERVER_IP`
- You'll see a security warning (normal without a domain)

## What's Next?

Congratulations! You now have Traefik installed and running. This means:

- **SSL certificates** are automatically managed
- **Secure connections** are enforced
- **Domain routing** is ready
- **Other applications** can now be installed

## Ready for Applications

Now you can install any of the applications in Infinity Tools:

- **WordPress** - For websites and blogs
- **Vaultwarden** - For password management
- **Nextcloud** - For file storage and sharing
- **And many more!**

When you install these applications, they'll automatically work with Traefik to provide secure, domain-based access.

## Troubleshooting

### Traefik Won't Start

If Traefik fails to start:

- Check that Docker is running: `sudo systemctl status docker`
- Check Docker logs: `docker logs traefik`
- Verify the configuration: `cat /opt/speedbits/traefik/traefik.yml`
- Try restarting: `docker restart traefik`

### SSL Certificate Issues

If SSL certificates aren't working:

- Make sure your domain points to your server's IP address
- Check that ports 80 and 443 are open
- Wait a few minutes for certificates to be issued
- Check Traefik logs: `docker logs traefik | grep -i acme`

## Can't Access Traefik

If you can't access Traefik:

- Check that Traefik is running: `docker ps | grep traefik`
- Verify ports are open: `sudo ss -tulnp | grep :80`
- Check firewall settings
- Try accessing via IP address instead of domain

## Quick Reference

### Check Traefik status:

```
docker ps | grep traefik
```

### View Traefik logs:

```
docker logs traefik
```

### Restart Traefik:

```
docker restart traefik
```

### Check SSL certificates:

```
ls -la /opt/speedbits/traefik/letsencrypt/
```

## You're Ready!

Traefik is now installed and running! This is the foundation that makes all your other applications work securely and efficiently.

### What you accomplished:

- Installed and configured Traefik
- Set up automatic SSL certificate management

- Created a secure gateway for your applications
- Prepared your system for other applications

**Next step:** You can now install any application from the Infinity Tools menu. Each application will automatically work with Traefik to provide secure, domain-based access.

## What You Learned

- **Traefik** - A reverse proxy that handles SSL and routing
- **SSL Certificates** - Automatic security certificates for your domains
- **Domain Routing** - How traffic is directed to the right application
- **Infrastructure Foundation** - The base layer that supports all other services

You now have a solid foundation for running secure, professional applications on your server!

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*Next: Installing Your First Application (Coming Soon)*

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