

# How to Configure Apache Load Balancer

Apache load balancer helps your websites handle large traffic loads without any performance issues. Here's how to configure Apache Load balancer for your website.

## Apache Load Balancer Configuration

Here are the steps to configure Apache load balancer for your website, on Ubuntu/Debian systems.

### 1. Install Required Apache modules

We require 4 Apache modules to configure Apache load balancer – *mod\_proxy*, *mod\_proxy\_http*, *mod\_proxy\_balancer*, *mod\_lbmethod\_byrequests*

- *mod\_proxy* is the main proxy module that redirects requests and allows Apache to act as gateway to backend servers
- *mod\_proxy\_http* allows support for proxying HTTP requests
- *mod\_proxy\_balancer* and *mod\_lbmethod\_byrequests* add load balancing capabilities to Apache web server.

Open terminal and run the following commands to install pre-requisite Apache modules.

```
$ sudo a2enmod proxy
$ sudo a2enmod proxy_http
$ sudo a2enmod proxy_balancer
$ sudo a2enmod lbmethod_byrequests
```

Bonus Read : Apache Reverse Proxy Configuration (<http://ubiq.co/tech-blog/apache-reverse-proxy-configuration-step-step/>)

### 2. Restart Apache Server

Restart Apache Server to apply changes

```
$ sudo service apache2 restart
```

### 3. Setup backend servers

To configure Apache Load Balancer, we will install flask & setup 2 servers to run on port 8080 and port 8081 as a backend server.

```
$ sudo apt-get update
$ sudo apt-get -y install python3-pip
$ sudo pip3 install flask
```

Flask comes with a readymade *~/backend.py* file that returns “Hello World” on requesting home page.

```
from flask import Flask
app = Flask(__name__)

@app.route('/')
def home():
    return 'Hello world!'
```

Bonus Read : How to Install and Configure mod\_pagespeed ([http://ubiq.co/tech-blog/install-configure-mod\\_pagespeed-apache/](http://ubiq.co/tech-blog/install-configure-mod_pagespeed-apache/))

We will create a copy of it for our second server.

```
$ sudo cp ~/backend.py ~/backend1.py
```

Open backend1.py and change the “Hello World” message in last line to “Hello World 2”

```
from flask import Flask
app = Flask(__name__)

@app.route('/')
def home():
    return 'Hello world 2!'
```

Bonus Read : How to Check if mod\_expires is enabled ([http://ubiq.co/tech-blog/check-mod\\_expires-enabled/](http://ubiq.co/tech-blog/check-mod_expires-enabled/))

We will run the first flask server

```
$ FLASK_APP=~/backend.py flask run --port=8080 >/dev/null 2>&1 &
```

You can test this server by running *curl* command

```
$ curl http://127.0.0.1:8080/
```

You will see the output as **Hello World!**

We will run the second flask server

```
$ FLASK_APP=~/backend1.py flask run --port=8081 >/dev/null 2>&1 &
```

You can test this server by running *curl* command

```
$ curl http://127.0.0.1:8081/
```

You will see the output as **Hello World 2!**

Now we have 2 backend servers ready to handle the load. We will be distributing load between these 2 servers.

Bonus Read : How to Secure Apache with Let’s Encrypt on Debian 10 (<http://ubiq.co/tech-blog/secure-apache-lets-encrypt-debian-10/>)

## 4. Configure Apache Load Balancer

We need to modify Apache’s default configuration file to configure Apache load balancer. Open Apache configuration in text editor

```
$ sudo vi /etc/apache2/sites-available/000-default.conf
```

Add the following lines to *VirtualHost* tag in Apache configuration file.

```
<Proxy balancer://mycluster>
    BalancerMember http://127.0.0.1:8080
    BalancerMember http://127.0.0.1:8081
</Proxy>
ProxyPreserveHost On
ProxyPass / balancer://mycluster/
ProxyPassReverse / balancer://mycluster/
```

Let’s look at the 3 directives.

- *ProxyPreserveHost* causes Apache to preserve original host header and pass it to back-end servers.
- *ProxyPass* is the main proxy directive which states that everything under root (/) should be directed to back-end cluster ( we have named it *mycluster*) of servers. If Apache gets request for /example, then it will send the request to *http://your\_backend\_server/example*
- *ProxyPassReverse* tells Apache to modify response header in the response received from back-end server. This is useful in case the back-end server returns a location redirect response, then the client will be redirected to Apache proxy server, instead of back-end server.
- We list our backend servers in *Proxy* tag named *balancer://mycluster* . You can change it to anything else. Inside this proxy tag, we list each backend server as *BalancerMember*. So your cluster’s *Proxy* tag can have one or more *BalancerMember*

```
<VirtualHost *:80>
...
<Proxy balancer://mycluster>
    BalancerMember http://127.0.0.1:8080
    BalancerMember http://127.0.0.1:8081
</Proxy>
ProxyPreserveHost On
ProxyPass / balancer://mycluster/
ProxyPassReverse / balancer://mycluster/
...
</VirtualHost>
```

Bonus Read : How to Enable mod\_headers in Apache ([http://ubiq.co/tech-blog/how-to-enable-mod\\_headers-in-apache/](http://ubiq.co/tech-blog/how-to-enable-mod_headers-in-apache/))

## 5. Restart Apache Server

Restart Apache Server to apply changes

```
$ sudo service apache2 restart
```


Hopefully, the above Apache load balancer configuration will help you setup Apache load balancer for your website.

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