Lab W09: Web Hosting and DNS

Lab: Let's host a video game

Debbie 是 IM.Inc 的系統工程師。今天上班時覺得無聊，想玩電腦遊戲，於是她發現了 這個列表，裡面有許多可在瀏覽器中遊玩的開源遊戲。請你選擇其中一個遊戲，部署在 VM 中並在你的個人電腦上遊玩。

For a VM with id `stnXY`, port forwarding is configured as follows:

VM port	Host port
80	80XY
8000	90XY

完成後請找助教 Demo 你的成果。

Lab: 欸你借我看一下

阿佑和阿鑫都是 IM.Inc 的系統工程師。今天早上，他們差點被卡車撞到，覺得自己運氣實在不太好，於是想讀讀聖經來洗滌心靈。聖經的純文字檔可以在這裡 下載。不過，由於公司對外頻寬有限，他們決定架設一個 CDN 來暫存並分流這個檔案，請你協助他們完成設定。）

1. Host the file on VM1, serving as the origin server.
2. Configure VM2 as a CDN edge node that caches and serves content from VM1.
3. Verify that the CDN on VM2 correctly forwards requests to VM1 when the requested file is not yet cached.
4. Measure and compare the latency and throughput between a cold cache (first-time access) and a hot cache (subsequent access).
5. Configure VM3 as another CDN edge node with gzip compression enabled.
6. Compare the performance and bandwidth efficiency between VM2 (without gzip) and VM3 (with gzip).

完成後請找助教 Demo 你的成果。

Lab: Internal DNS

阿如是 Im.Inc 的資深系統工程師。今天 Im.Inc 購買了一批新的伺服器，她的這個月的目標就是為這批新的伺服器架設一個 DNS 系統，請完成以下：

1. Set up a DNS server on your VM.
2. Create an A record that maps the address `10.0.2.<your-group-id>` to the domain `group-<your-group-id>.lsap.com`. For example, if your group ID is 3, map `10.0.2.3` to `group-3.lsap.com`.
3. Configure Round-Robin DNS for `group-<your-group-id>.prod.lsap.com` that distributes requests across IP addresses `10.0.3.0` through `10.0.3.9`.
4. Add a CNAME record that maps `www.group-<your-group-id>.lsap.com` to `group-<your-group-id>.lsap.com`.

5. Create an MX record for `group-<your-group-id>.lsap.com` that points to `mail.lsap.com`.

完成後請找助教 Demo 你的成果。

Lab: Improved DNS

接續上個月的任務,這個月阿如要進一步完善她架設的 DNS 系統,請完成以下:

1. Enable recursive queries on your DNS server so that it can resolve external domains such as `google.com`.
2. Configure DNSSEC to provide authentication and data integrity for DNS responses. This involves the following steps:
   1. Enable `dnssec-validation`.
   2. Generate a key pair.
   3. Include the public key in the zone file.
   4. Sign the zone file using the generated keys.
   5. Add the signed zone file reference to `named.conf.local`.

完成後請找助教 Demo 你的成果。