

109 年委託開發報告

109 年度  
「IPv6 動態 DNS 服務軟體開發」  
IPv6 動態 DNS Server 軟體安裝建置手冊

計畫委託機關：台灣網路資訊中心

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# 109 年委託開發報告

## 109 年度「IPv6 動態 DNS 服務軟體開發」

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## 第一章 在 Centos8 安裝 DDNS 平台

### 第一節 套件安裝(BIND、MySQL、PHP)

本平台架設在 CentOS Linux release 8.2.2004 下，搭配使用 Nginx、PHP、MySQL、BIND9 還有一些額外的套件。建議安裝者本身需要有使用 Nginx、MySQL 及 BIND9 的經驗。

表 1 軟體版本資訊

軟體	版本
<b>PHP</b>	7.4.10
<b>Nginx</b>	1.14.1-9
<b>MySQL</b>	8.0.17-3
<b>BIND</b>	9.16.4

## 步驟 1. 安裝 PHP

```
dnf module install php:remi-7.4    #由於 PHP 有許多版本，故需指定  
要安裝的版本
```

```
dnf update    #更新 repository 資訊
```

```
dnf module enable php:remi-7.4    #指定啟用 PHP 7.4
```

```
dnf install php php-cli php-common unzip php74-php-pecl-zip sudo  
php-fpm php-gd php-json php-mbstring php-mysqlnd php-opcache  
php-pdo php-pecl-apcu php-pecl-zip php-xml #安裝 PHP 及相關套件
```

## 步驟 2. 安裝 composer

```
php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
php -r "if (hash_file('sha384', 'composer-setup.php') ===
'795f976fe0ebd8b75f26a6dd68f78fd3453ce79f32ecb33e7fd087d39bfeb9
78342fb73ac986cd4f54edd0dc902601dc') { echo 'Installer verified'; }
else { echo 'Installer corrupt'; unlink('composer-setup.php'); } echo
PHP_EOL;"
php composer-setup.php
php -r "unlink('composer-setup.php');"
```

以上為 composer 官方的安裝步驟，直接複製貼上即可

```
mv composer.phar /usr/local/bin/composer #將 composer.phar 搬移到
可執行的路徑
```



### 步驟 3. 安裝 nginx

```
yum install -y nginx #安裝 Nginx 套件
```

#### 步驟 4. 安裝 mysql

```
yum -y install @mysql #安裝系統預設的 MySQL
```

```
systemctl start mysqld #啟動 MySQL
```

```
systemctl enable --now mysqld #將 MySQL 設定為在開機後自動啟動
```

```
systemctl status mysqld #檢查 MySQL 狀態
```

```
systemctl enable php-fpm #將 PHP-FPM 設定為在開機時自動啟動
```

```
systemctl start php-fpm #啟動 PHP-FPM
```

```
systemctl enable nginx #將 Nginx 設定為開機後自動啟動
```

```
systemctl start nginx #啟動 Nginx
```

### 步驟 5. 安裝 BIND 編譯過程中所需套件

```
yum install -y git wget curl #安裝工具，後面會使用到
yum install -y gcc python3-pip libcap-devel libuv make openssl-devel
mysql-devel bind-utils #安裝編譯 BIND 原始碼需要用到的套件
pip3 install ply
yum install epel-release #安裝 EPEL repository
rpm -ivh
https://download-ib01.fedoraproject.org/pub/epel/8/Modular/x86\_64/Packages/l/libuv-devel-1.23.1-2.module\_el8+8698+518af944.x86\_64.rpm #
安裝 libuv-devel 套件，此套件在 Centos 內找不到，需要單獨從網站
上下載安裝
```

## 步驟 6. 安裝 BIND

```
wget ftp://ftp.isc.org/isc/bind9/9.16.4/bind-9.16.4.tar.xz #下載 BIND 原始碼

tar xvf bind-9.16.4.tar.xz #解壓縮

cd bind-9.16.4 #切換到原始碼目錄內

./configure --prefix=/usr/local/bind/ --enable-threads=no
--with-dlz-mysql --with-openssl #設定下一步編譯時的參數

make -j 4 && make install #進行編譯

cd /usr/local/bind/etc/ && ../sbin/rndc-confgen > rndc.conf && tail
-n10 rndc.conf | head -n9 | sed -e s/#//g >named.conf && dig >
named.root #產生 named.conf 設定檔案

vim /usr/local/bind/etc/localhost.zone #編輯 localhost.zone 檔案
```

```
$ttl 86400
@ IN SOA localhost. root.localhost. (
    2020091601
    28800
    14400
    3600000
    86400 )
IN NS localhost.
1 IN PTR localhost.
```

圖 1 localhost.zone 設定

```
$ttl 86400
@ IN SOA localhost. root.localhost. (
    2020091601
    28800
    14400
```

		3600000	
		86400 )	
	IN	NS	localhost.
1		IN PTR	localhost.

## 第二節 BIND 及 MySQL 套件設定

### 步驟 1. 產生金鑰

```
mkdir /usr/local/bind/etc/keys #新增存放金鑰的目錄  
cd /usr/local/bind/etc/keys #切換到金鑰的目錄內  
/usr/local/bind/sbin/tsig-keygen -a hmac-sha512 ddns.idv.tw >  
/usr/local/bind/etc/keys/ddns.idv.tw.key #產生金鑰
```

## 步驟 2. 將金鑰放入 /usr/local/bind/etc/named.conf

```
echo 'include "/usr/local/bind/etc/keys/ddns.idv.tw.key;" >>
/usr/local/bind/etc/named.conf #將產生的金鑰放到 named.conf
```

```
key "rndc-key" {
    algorithm hmac-sha256;
    secret
"reb8XtmMBGK5CmPf3GDd0xEFrwrAdAcoxcM4EliFvqw=";
};

controls {
    inet 127.0.0.1 port 953
        allow { 127.0.0.1; } keys { "rndc-key"; };
};

include "/usr/local/bind/etc/keys/ddns.idv.tw.key";

logging {
    channel error_log {
        file "/usr/local/bind/var/error.log" versions 10 size
32m;
        severity warning;
        print-time yes;
        print-severity yes;
        print-category yes;
    };
    channel query_log {
        file "/usr/local/bind/var/query.log" versions 10 size
32m;
        severity debug;
        print-time yes;
        print-severity yes;
        print-category yes;
    };
    category default { error_log; };
};
```

```
        category queries { query_log; };

};

options {
    directory "/usr/local/bind/etc";
    pid-file "named.pid";
    allow-query { any; };
    recursion yes;
    forwarders{ 8.8.8.8; 8.8.4.4; };
    listen-on port 53 { any; };
    listen-on-v6 port 53 { ::1; };
};
acl "dnsip-list" {
    172.17.0.2;
};
include "/usr/local/bind/etc/named.dlz.zones";
```



### 第三節 檢查 BIND 設定

```
/usr/local/bind/sbin/named-checkconf -p -z  
/usr/local/bind/etc/named.conf    #檢查 named.conf 設定檔案是否正  
確  
  
echo $? #檢查上述步驟的跳出代碼  
  
0    #代表正確
```

### 步驟 1. 建立 mysql 連線帳號

```
mysql> create user 'ipv6ddns'@'localhost' identified with  
mysql_native_password by 'ipv6ddns'; #新增一個 ipv6ddns 帳號  
mysql> grant all privileges on ipv6ddns.to 'ipv6ddns'@'localhost';  
mysql> flush privileges; #更新權限
```

## 步驟 2. 建立 mysql schema

```
DROP TABLE IF EXISTS `apikey`;

CREATE TABLE `apikey` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `apikey` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;


# Dump of table db
# -----

DROP TABLE IF EXISTS `db`;

CREATE TABLE `db` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `title` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `content` text CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;
```

```

# Dump of table dns_records
# -----

DROP TABLE IF EXISTS `dns_records`;

CREATE TABLE `dns_records` (
  `id` int(32) NOT NULL AUTO_INCREMENT,
  `zone` varchar(255) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `host` varchar(255) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `type` enum('MX','CNAME','NS','SOA','A','PTR','AAAA','TXT')
CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci
DEFAULT NULL,
  `data` varchar(1000) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci NOT NULL DEFAULT "",
  `ttl` int(11) DEFAULT '600',
  `mx_priority` int(11) DEFAULT NULL,
  `refresh` int(11) DEFAULT '600',
  `retry` int(11) DEFAULT NULL,
  `expire` int(11) DEFAULT '86400',
  `minimum` int(11) DEFAULT '3600',
  `serial` bigint(20) DEFAULT '2020091601',
  `resp_person` varchar(1000) CHARACTER SET utf8mb4
COLLATE utf8mb4_unicode_ci DEFAULT "",
  `primary_ns` varchar(1000) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT "",
  `dynaload` tinyint(1) DEFAULT '0',
  `datestamp` datetime DEFAULT NULL,
  `regnumber` varchar(64) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT '0000000',
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `updated_at` timestamp NULL DEFAULT NULL ON UPDATE
CURRENT_TIMESTAMP,

```

```

PRIMARY KEY (`id`),
KEY `host_index` (`host`),
KEY `zone_index` (`zone`),
KEY `type_index` (`type`)
) ENGINE=InnoDB AUTO_INCREMENT=13 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

# Dump of table email
# -----

DROP TABLE IF EXISTS `email`;

CREATE TABLE `email` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `sender` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `receiver` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `title` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `content` text CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```
# Dump of table inactive_zones
```

```
# -----
```

```
DROP TABLE IF EXISTS `inactive_zones`;
```

```
CREATE TABLE `inactive_zones` (  
  `zone` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci NOT NULL DEFAULT ""  
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4  
COLLATE=utf8mb4_unicode_ci;
```

```
# Dump of table ipdata
```

```
# -----
```

```
DROP TABLE IF EXISTS `ipdata`;
```

```
CREATE TABLE `ipdata` (  
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `country_code` varchar(5) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `locale` varchar(10) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `currency` varchar(10) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `latitude` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `longtiude` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `currency_symbol` varchar(10) CHARACTER SET utf8mb4  
COLLATE utf8mb4_unicode_ci DEFAULT NULL,  
  `in_eu` int(11) DEFAULT NULL,  
  `region` varchar(50) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,
```

```

`regioncode` varchar(50) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`city` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`time_zone` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`updated_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
PRIMARY KEY (`id`),
KEY `ip` (`ip`),
KEY `country_code` (`country_code`),
KEY `locale` (`locale`),
KEY `currency` (`currency`),
KEY `updated_at` (`updated_at`),
KEY `latitude` (`latitude`),
KEY `longtiude` (`longtiude`),
KEY `currency_symbol` (`currency_symbol`),
KEY `in_eu` (`in_eu`),
KEY `region` (`region`),
KEY `regioncode` (`regioncode`),
KEY `city` (`city`),
KEY `time_zone` (`time_zone`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table ipfail

```

```

# -----

```

```

DROP TABLE IF EXISTS `ipfail`;

```

```

CREATE TABLE `ipfail` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,

```

```

PRIMARY KEY (`id`),
KEY `ip` (`ip`),
KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

# Dump of table login
# -----

DROP TABLE IF EXISTS `login`;

CREATE TABLE `login` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `email` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `email` (`email`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

# Dump of table loginfail
# -----

DROP TABLE IF EXISTS `loginfail`;

```



```

CREATE TABLE `loginfail` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `email` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `email` (`email`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB AUTO_INCREMENT=1783 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table meta_data

```

```

# -----

```

```

DROP TABLE IF EXISTS `meta_data`;

```

```

CREATE TABLE `meta_data` (
  `next_id` int(8) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table other

```

```

# -----

```

```

DROP TABLE IF EXISTS `other`;

```

```

CREATE TABLE `other` (

```

```

`id` int(10) unsigned NOT NULL AUTO_INCREMENT,
`ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`title` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`content` text CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci,
`created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
`checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
PRIMARY KEY (`id`),
KEY `checkval` (`checkval`),
KEY `ip` (`ip`),
KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table replication_heartbeat

```

```

# -----

```

```

DROP TABLE IF EXISTS `replication_heartbeat`;

```

```

CREATE TABLE `replication_heartbeat` (
  `timestamp` timestamp NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table users

```

```

# -----

```

```

DROP TABLE IF EXISTS `users`;

```

```

CREATE TABLE `users` (

```

```

`id` int(10) unsigned NOT NULL AUTO_INCREMENT,
`email` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`firstname` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`lastname` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`pw` varchar(250) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`avator` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
`temp_pw` varchar(250) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`temp_pw_created` timestamp NULL DEFAULT NULL,
`temp_pw_expired` timestamp NULL DEFAULT NULL,
`verify_code` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
`is_verified` tinyint(1) DEFAULT '0',
`is_deleted` tinyint(3) unsigned DEFAULT '0',
PRIMARY KEY (`id`),
UNIQUE KEY `email` (`email`),
KEY `firstname` (`firstname`),
KEY `lastname` (`lastname`),
KEY `is_verified` (`is_verified`),
KEY `verify_code` (`verify_code`),
KEY `is_deleted` (`is_deleted`)
) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

```

```
# Dump of table xfr_table
```

```
# -----
```

```
DROP TABLE IF EXISTS `xfr_table`;
```

```
CREATE TABLE `xfr_table` (  
  `zone` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci NOT NULL,  
  `client` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci NOT NULL,  
  KEY `zone_client_index` (`zone`,`client`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4  
COLLATE=utf8mb4_unicode_ci;
```

### 步驟 3. 編輯 /usr/local/bind/etc/named.dlz.zones

```
dlz "Mysql zone" {  
    database "mysql"  
    {host=localhost dbname=ipv6ddns user=ipv6ddns pass=  
@ipv6Ddns123 ssl=false}  
    {select zone from dns_records where zone = '%zone%'}  
    {select ttl, type, mx_priority, case when lower(type)='txt' then  
concat("\", data, "\"")  
        when lower(type) = 'soa' then concat_ws(' ', data, resp_person,  
serial, refresh, retry, expire, minimum)  
        else data end from dns_records where zone = '%zone%' and  
host = '%record%'}";  
};
```

#### 第四節 測試 BIND 及 MySQL

```
/usr/local/bind/sbin/named -g -c /usr/local/bind/etc/named.conf #啟動  
named 服務，並且將結果在 console 上顯示
```

```
17-Sep-2020 02:01:11.422 starting BIND 9.16.4 (Stable Release)  
<id:0849b42>  
17-Sep-2020 02:01:11.422 running on Linux x86_64 4.19.76-linuxkit  
#1 SMP Tue May 26 11:42:35 UTC 2020  
17-Sep-2020 02:01:11.422 built with '--prefix=/usr/local/bind/'  
'--enable-threads=no' '--with-dlz-mysql' '--with-openssl'  
17-Sep-2020 02:01:11.422 running as: named -g -c  
/usr/local/bind/etc/named.conf  
17-Sep-2020 02:01:11.423 compiled by GCC 8.3.1 20191121 (Red Hat  
8.3.1-5)  
17-Sep-2020 02:01:11.423 compiled with OpenSSL version: OpenSSL  
1.1.1c FIPS 28 May 2019  
17-Sep-2020 02:01:11.423 linked to OpenSSL version: OpenSSL 1.1.1c  
FIPS 28 May 2019  
17-Sep-2020 02:01:11.423 compiled with zlib version: 1.2.11  
17-Sep-2020 02:01:11.423 linked to zlib version: 1.2.11  
17-Sep-2020 02:01:11.423 -----  
17-Sep-2020 02:01:11.423 BIND 9 is maintained by Internet Systems  
Consortium,  
17-Sep-2020 02:01:11.423 Inc. (ISC), a non-profit 501(c)(3)  
public-benefit  
17-Sep-2020 02:01:11.423 corporation. Support and training for  
BIND 9 are  
17-Sep-2020 02:01:11.423 available at https://www.isc.org/support  
17-Sep-2020 02:01:11.423 -----  
17-Sep-2020 02:01:11.423 found 2 CPUs, using 2 worker threads  
17-Sep-2020 02:01:11.423 using 2 UDP listeners per interface  
17-Sep-2020 02:01:11.424 using up to 21000 sockets  
17-Sep-2020 02:01:11.428 loading configuration from  
'/usr/local/bind/etc/named.conf'
```

```
17-Sep-2020 02:01:11.430 reading built-in trust anchors from file
'/usr/local/bind/etc/bind.keys'
17-Sep-2020 02:01:11.431 using default UDP/IPv4 port range: [32768,
60999]
17-Sep-2020 02:01:11.432 using default UDP/IPv6 port range: [32768,
60999]
17-Sep-2020 02:01:11.434 listening on IPv4 interface lo, 127.0.0.1#53
17-Sep-2020 02:01:11.436 listening on IPv4 interface eth0,
172.17.0.2#53
17-Sep-2020 02:01:11.438 generating session key for dynamic DNS
17-Sep-2020 02:01:11.440 sizing zone task pool based on 0 zones
17-Sep-2020 02:01:11.441 Loading 'Mysql zone' using driver mysql
17-Sep-2020 02:01:11.441 Required token $zone$ not found.
17-Sep-2020 02:01:11.442 Could not build find zone query list
17-Sep-2020 02:01:11.442 mysql driver could not create database
instance object.
17-Sep-2020 02:01:11.443 SDLZ driver failed to load.
17-Sep-2020 02:01:11.444 DLZ driver failed to load.
17-Sep-2020 02:01:11.445 loading configuration: failure
17-Sep-2020 02:01:11.446 exiting (due to fatal error)
[root@ffaea99cbf93 bind]# /usr/local/bind/sbin/named -g -c
/usr/local/bind/etc/named.conf
17-Sep-2020 02:01:32.265 starting BIND 9.16.4 (Stable Release)
<id:0849b42>
17-Sep-2020 02:01:32.265 running on Linux x86_64 4.19.76-linuxkit
#1 SMP Tue May 26 11:42:35 UTC 2020
17-Sep-2020 02:01:32.265 built with '--prefix=/usr/local/bind/'
'--enable-threads=no' '--with-dlz-mysql' '--with-openssl'
17-Sep-2020 02:01:32.265 running as: named -g -c
/usr/local/bind/etc/named.conf
17-Sep-2020 02:01:32.265 compiled by GCC 8.3.1 20191121 (Red Hat
8.3.1-5)
17-Sep-2020 02:01:32.265 compiled with OpenSSL version: OpenSSL
1.1.1c FIPS 28 May 2019
17-Sep-2020 02:01:32.265 linked to OpenSSL version: OpenSSL 1.1.1c
FIPS 28 May 2019
17-Sep-2020 02:01:32.265 compiled with zlib version: 1.2.11
17-Sep-2020 02:01:32.266 linked to zlib version: 1.2.11
```

```

17-Sep-2020 02:01:32.266 -----
17-Sep-2020 02:01:32.267 BIND 9 is maintained by Internet Systems
Consortium,
17-Sep-2020 02:01:32.267 Inc. (ISC), a non-profit 501(c)(3)
public-benefit
17-Sep-2020 02:01:32.267 corporation.  Support and training for
BIND 9 are
17-Sep-2020 02:01:32.267 available at https://www.isc.org/support
17-Sep-2020 02:01:32.267 -----
17-Sep-2020 02:01:32.267 found 2 CPUs, using 2 worker threads
17-Sep-2020 02:01:32.268 using 2 UDP listeners per interface
17-Sep-2020 02:01:32.270 using up to 21000 sockets
17-Sep-2020 02:01:32.274 loading configuration from
'/usr/local/bind/etc/named.conf'
17-Sep-2020 02:01:32.274 reading built-in trust anchors from file
'/usr/local/bind/etc/bind.keys'
17-Sep-2020 02:01:32.275 using default UDP/IPv4 port range: [32768,
60999]
17-Sep-2020 02:01:32.275 using default UDP/IPv6 port range: [32768,
60999]
17-Sep-2020 02:01:32.276 listening on IPv4 interface lo, 127.0.0.1#53
17-Sep-2020 02:01:32.277 listening on IPv4 interface eth0,
172.17.0.2#53
17-Sep-2020 02:01:32.279 generating session key for dynamic DNS
17-Sep-2020 02:01:32.279 sizing zone task pool based on 0 zones
17-Sep-2020 02:01:32.279 Loading 'Mysql zone' using driver mysql
17-Sep-2020 02:01:32.285 none:98: 'max-cache-size 90%' - setting to
1792MB (out of 1991MB)
17-Sep-2020 02:01:32.289 obtaining root key for view _default from
'/usr/local/bind/etc/bind.keys'
17-Sep-2020 02:01:32.289 set up managed keys zone for view _default,
file 'managed-keys.bind'
17-Sep-2020 02:01:32.290 none:98: 'max-cache-size 90%' - setting to
1792MB (out of 1991MB)
17-Sep-2020 02:01:32.295 command channel listening on
127.0.0.1#953
17-Sep-2020 02:01:32.295 not using config file logging statement for
logging due to -g option

```



17-Sep-2020 02:01:32.297 managed-keys-zone: loaded serial 13  
17-Sep-2020 02:01:32.298 all zones loaded  
17-Sep-2020 02:01:32.298 running  
17-Sep-2020 02:01:32.515 managed-keys-zone: Key 20326 for zone . is  
now trusted (acceptance timer complete)  
17-Sep-2020 02:01:32.536 resolver priming query complete

### 步驟 1. 測試 DNS server 是否可以正常回應

host ddns.idv.tw localhost #以 host 指令，檢查測試網域的結果

dig @localhost google.com #以 dig 指令，檢查是否可以查詢到外部的  
主機

dig ddns.idv.tw #以 dig 指令檢查網域的結果

```
Using domain server:  
Name: localhost  
Address: 127.0.0.1#53  
Aliases:  
  
ns1.sparkplugbb.net has address 10.10.10.10
```

圖 2 dig 指令查詢結果

Using domain server:

Name: localhost

Address: 127.0.0.1#53

Aliases:

ns1.sparkplugbb.net has address 10.10.10.10

## 步驟 2. 檢查 log 輸出

```
17-Sep-2020 02:06:58.653 client @0x7f4c3c000cd0 127.0.0.1#39844  
(ns1.sparkplugbb.net): query: ns1.sparkplugbb.net IN A + (127.0.0.1)  
17-Sep-2020 02:06:58.656 client @0x7f4c3c000cd0 127.0.0.1#47308  
(ns1.sparkplugbb.net): query: ns1.sparkplugbb.net IN AAAA +  
(127.0.0.1)
```

### 步驟 3. 啟動 named

```
/usr/local/bind/sbin/named -c /usr/local/bind/etc/named.conf #啟動  
named
```

#### 步驟 4. 修改 resolv.conf 檔案，指定 name server

```
sudo vim /etc/resolv.conf
```

```
nameserver 18.219.170.145 #新增加
```

```
nameserver 127.0.0.1
```

```
nameserver 8.8.8.8
```

```
nameserver 8.8.4.4
```

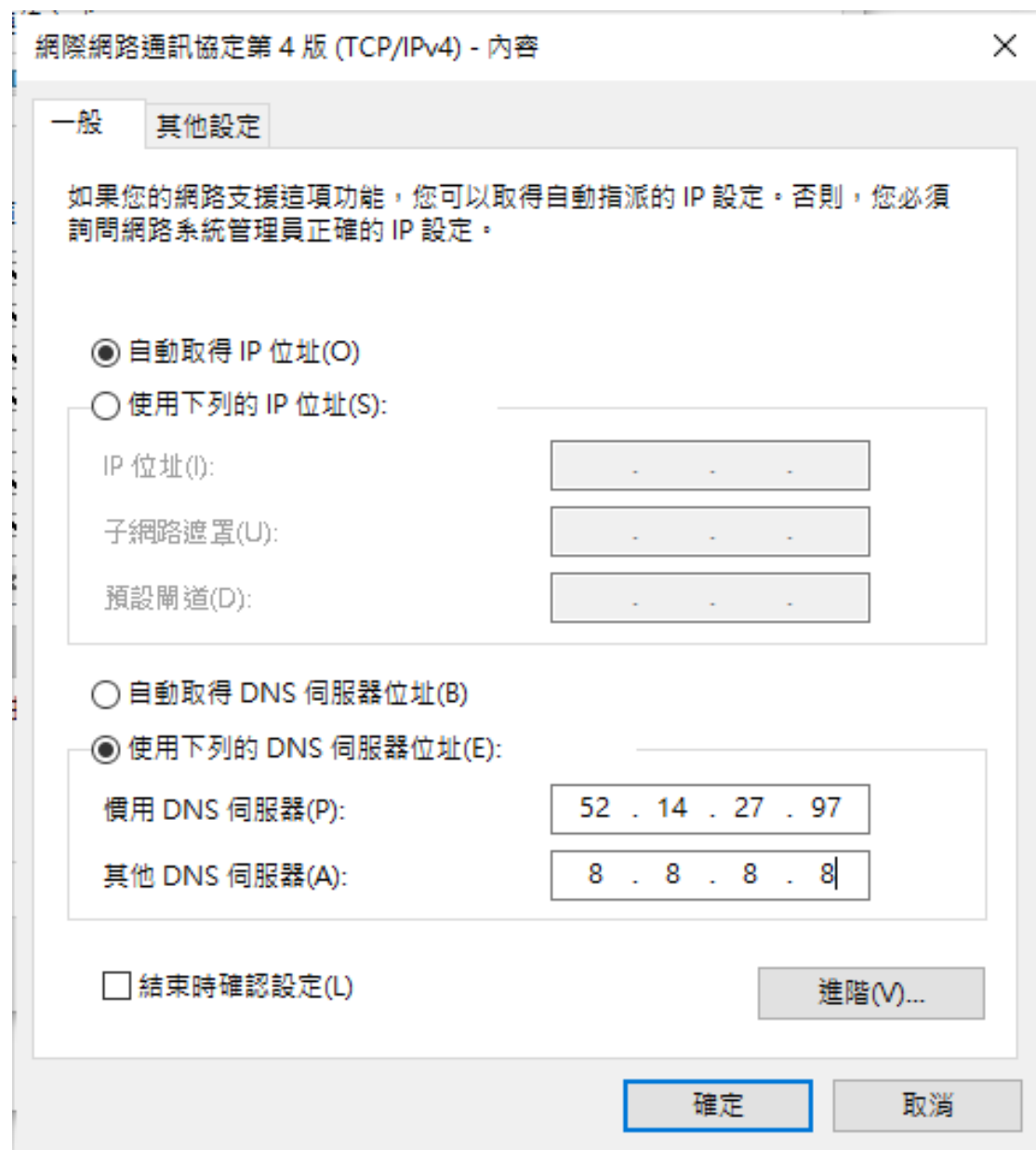


圖 3 Windows 下指定 DNS



## 第五節 安裝 DDNS 管理平台

是利用 PHP、Mysql 跟 Nginx 搭配開發的一套系統，本系統的提供管理功能，讓使用者可以輕易的透過管理平台進行網域與主機的設定。

```
git clone https://github.com/tripbnb66/ipv6ddns.git #解壓縮原始檔案
cd ipv6ddns
composer install #安裝所需 packages
cd cron/
new_cache.sh #產生 cache 目錄, 設定權限
```

安裝完成之後，就可以透過瀏覽器如 Chrome、IE 或者 Safari 瀏覽主機的位址，例如 `http://192.168.1.1/`（實際 IP 位址要換成您的安裝主機 IP）。安裝完成後，如果有遇到問題，可以檢查

`/var/log/php-fpm/www-error.log` 或 `/var/log/nginx/error.log`。相關的錯誤訊息都會丟到這兩個檔案的其中一個。`www-error.log` 是收集跟 PHP 相關的錯誤訊息，而 `error.log` 是收集 Nginx 的錯誤訊息。

## 步驟 1. 設定網域

你需要在你當初購買網域的服務商，將原本代管的 name server 指向自己架設的 DDNS Server，這樣之後的主機名稱解析，就會由你架設的 DDNS Server 處理。

以 PCHome 為例，進入到 PCHome 的網頁之後，選擇「自管 DNS」，然後填入你自己的 name server 名稱，然後儲存。靜待 24 至 48 小時之後，設定就會生效。



管理我的網址 ▾ | 購買與續用 ▾ | 價格與教學 ▾ | 工具使用 ▾ | 尋求幫助 ▾

PCHome > 買網址 管理我的網址

### 設定DNS

您的網域名稱：**ddns.idv.tw**

☒ 自管DNS ☐ PCHome代管DNS ☐ 動態DNS ☐ Page Parking ☐ 一站式功能

[進階DNSSEC設定](#) [網站啟用IPv6設定|教學](#) [DNS 自管設定說明](#) [圖例教學](#)

自管DNS		
表示不會透過 PCHome 解析您的網址，而是您自己的 DNS 對外回應指向(權威回答)，請確定您的伺服器有 DNS 功能後再填入以下資料，若單純只是有固定 IP 的 web 伺服器，請改選擇 (PCHome代管DNS) 使用 A 紀錄來對應		
Name Server (NS)	IP 位址	IPv6 位址
ns1.ddns.idv.tw	52.14.27.97	
ns2.ddns.idv.tw	52.14.27.97	

圖 4 PCHome 設定自管 DNS



## 第二章 在 AWS EC2 安裝 DDNS 平台

AWS EC2 的 Linux 環境類似 Centos7 的版本，以下提供 AWS EC2 下安裝的步驟。

## 第一節 套件安裝(BIND、MySQL、PHP)

### 步驟 1. AWS EC2 (free, centos7)安裝基本環境

```
sudo amazon-linux-extras install epel #安裝 epel  
sudo yum -y install epel-release  
sudo yum -y install  
http://rpms.remirepo.net/enterprise/remi-release-7.rpm #安裝 remi  
sudo amazon-linux-extras enable php7.4 #安裝 php  
sudo yum clean metadata  
sudo yum remove -y php php-cli php-fpm # 移除 EC2 內建的 PHP5  
sudo yum install -y php php-cli php-gd php-json php-mbstring  
php-mysqlnd php-opcache php-pdo php-xml php-pecl-zip php-fpm #  
安裝 PHP7
```

## 步驟 2. 安裝 composer

```
php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
php -r "if (hash_file('sha384', 'composer-setup.php') ===
'c31c1e292ad7be5f49291169c0ac8f683499edddcfd4e42232982d0fd1930
04208a58ff6f353fde0012d35fdd72bc394') { echo 'Installer verified'; }
else { echo 'Installer corrupt'; unlink('composer-setup.php'); } echo
PHP_EOL;"
php composer-setup.php
php -r "unlink('composer-setup.php');"

sudo mv composer.phar /usr/local/bin/composer
```

```
Warning: unlink(composer-setup.php): No such file or directory in command line code on line 1
[ec2-user@ip-172-31-27-5 ~]$ php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
[ec2-user@ip-172-31-27-5 ~]$ php -r "if (hash_file('sha384', 'composer-setup.php') === 'c31c1e292ad7be5f49291169c0
ac8f683499edddcfd4e42232982d0fd193004208a58ff6f353fde0012d35fdd72bc394') { echo 'Installer verified'; } else { ech
o 'Installer corrupt'; unlink('composer-setup.php'); } echo PHP_EOL;"
Installer verified
[ec2-user@ip-172-31-27-5 ~]$ php composer-setup.php
All settings correct for using Composer
Downloading...

Composer (version 1.10.15) successfully installed to: /home/ec2-user/composer.phar
Use it: php composer.phar
[ec2-user@ip-172-31-27-5 ~]$ php -r "unlink('composer-setup.php');"
Warning: unlink(composer-setup.php): No such file or directory in command line code on line 1
```

圖 5 安裝 composer

### 步驟 3. 安裝 Mysql、PHP

```
sudo yum install -y nginx
sudo yum install -y
https://dev.mysql.com/get/mysql80-community-release-el7-3.noarch.rpm
sudo yum install -y mysql-community-server

sudo systemctl start mysqld #啟動 mysql

sudo systemctl enable mysqld #開機預設啟動 mysql

sudo systemctl enable php-fpm #開機預設啟動 php-fpm

sudo systemctl start php-fpm #啟動 php-fpm

sudo systemctl enable nginx #開機預設啟動 nginx

sudo systemctl start nginx #啟動 nginx

sudo grep 'temporary password' /var/log/mysqld.log #取得暫時密碼

mysql -uroot -p
mysql> ALTER USER 'root'@'localhost' IDENTIFIED BY
'@ipV6Ddns123';
mysql> flush privileges;
```

```
[ec2-user@ip-172-31-27-5 ~]$ sudo grep 'temporary password' /var/log/mysqld.log
2020-10-13T04:08:25.176542Z 6 [Note] [MY-010454] [Server] A temporary password is generated for root@localhost: iq
BYt0daG0(a
[ec2-user@ip-172-31-27-5 ~]$
```

圖 6 取出暫時密碼

#### 步驟 4. 安裝 BIND 編譯過程中所需套件

```
sudo yum install -y git wget curl  
sudo yum install -y gcc python3-pip libcap-devel libuv make  
openssl-devel mysql-devel bind-utils libuv-devel bind-chroot  
sudo pip3 install ply  
sudo yum install -y epel-release
```

## 步驟 5. 安裝 BIND

```
wget ftp://ftp.isc.org/isc/bind9/9.16.4/bind-9.16.4.tar.xz
tar xvf bind-9.16.4.tar.xz
cd bind-9.16.4
./configure --prefix=/usr/local/bind/ --enable-threads=no
--with-dlz-mysql --with-openssl
make -j 4
sudo make install
sudo su -
cd /usr/local/bind/etc/
../sbin/rndc-confgen > rndc.conf && tail -n10 rndc.conf | head -n9 |
sed -e s/#\\g >named.conf && dig > named.root

vim /usr/local/bind/etc/localhost.zone
```

```
Very verbose query trace logging (--enable-querytrace)
Use GNU libtool (--with-libtool)
CMocka Unit Testing Framework (--with-cmocka)
XML statistics (--with-libxml2)
JSON statistics (--with-json-c)
LMDB database to store configuration for 'addzone' zones (--with-lmdb)
IDN support (--with-libidn2)

-----
Configured paths:
prefix: /usr/local/bind
sysconfdir: ${prefix}/etc
localstatedir: ${prefix}/var
-----
Compiler: gcc
gcc (GCC) 7.3.1 20180712 (Red Hat 7.3.1-9)
Copyright (C) 2017 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

Unrecognized options:
--enable-threads
-----
For more detail, use --enable-full-report.
=====
[ec2-user@ip-172-31-27-5 bind-9.16.4]$
```

圖 7 編譯 BIND 原始碼

```
$ttl 86400
@ IN SOA localhost. root.localhost. (
2020091601
```

		28800	
		14400	
		3600000	
		86400 )	
	IN	NS	localhost.
1		IN PTR	localhost.

## 第二節 BIND 及 MySQL 套件設定

### 步驟 1. 產生金鑰

```
mkdir /usr/local/bind/etc/keys  
cd /usr/local/bind/etc/keys  
/usr/local/bind/sbin/tsig-keygen -a hmac-sha512 ddns.idv.tw >  
/usr/local/bind/etc/keys/ddns.key
```



## 步驟 2. 建立 mysql 連線帳號

```
mysql -uroot -p@ipv6Ddns123
```

```
#建立資料庫
```

```
mysql> create database ipv6ddns CHARACTER SET utf8mb4  
COLLATE utf8mb4_unicode_ci;
```

```
# 變更帳號密碼
```

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH  
mysql_native_password BY '@ipv6Ddns123';  
mysql> create user 'ipv6ddns'@'localhost' identified with  
mysql_native_password by '@ipv6Ddns123';  
mysql> alter user 'ipv6ddns'@'localhost' identified with  
mysql_native_password by '@ipv6Ddns123';  
mysql> grant all privileges on ipv6ddns.* to 'ipv6ddns'@'localhost';  
mysql> flush privileges;
```

```
sudo vim /etc/my.cnf.d/mysql-default-authentication-plugin.cnf
```

```
[mysqld]
```

```
default_authentication_plugin=mysql_native_password
```

```
sudo systemctl restart mysqld
```

### 步驟 3. 編輯 /usr/local/bind/etc/named.dlz.zones

注意: centos8 是用 %zone%, 而 centos7 是用 \$zone\$

```
sudo vim /usr/local/bind/etc/named.dlz.zones
```

```
dlz "Mysql zone" {
    database "mysql"
    {host=localhost dbname=ipv6ddns user=root pass=@ipv6Ddns123
ssl=false}
    {select zone from dns_records where zone = '$zone$'}
    {select ttl, type, mx_priority, case when lower(type)='txt' then
concat("\", data, "\")
        when lower(type) = 'soa' then concat_ws(' ', data, resp_person,
serial, refresh, retry, expire, minimum)
        else data end from dns_records where zone = '%zone%' and
host = '$record$'}";
};
```

#### 步驟 4. 將金鑰放入 named.conf

```
sudo vim /usr/local/bind/etc/named.conf
```

```
key "rndc-key" {
    algorithm hmac-sha256;
    secret
"reb8XtmMBGK5CmPf3GDd0xEFrwrAdAcoxcM4EliFvqw=";
};

controls {
    inet 127.0.0.1 port 953
        allow { 127.0.0.1; } keys { "rndc-key"; };
};

zone "." IN {
    type hint;
    file "/usr/local/bind/etc/named.root";
};
include "/usr/local/bind/etc/keys/ddns.key";

logging {
    channel error_log {
        file "/usr/local/bind/var/error.log" versions 10 size
32m;

        severity warning;
        print-time yes;
        print-severity yes;
        print-category yes;
    };
    channel query_log {
        file "/usr/local/bind/var/query.log" versions 10 size
32m;

        severity debug;
        print-time yes;
        print-severity yes;
        print-category yes;
```

```
};
category default { error_log; };
category queries { query_log; };

};

options {
    directory "/usr/local/bind/etc";
    pid-file "named.pid";
    allow-query { any; };
    recursion yes;
    forwarders{ 8.8.8.8; 8.8.4.4; };
    listen-on port 53 { any; };
    listen-on-v6 port 53 { ::1; };
};
include "/usr/local/bind/etc/named.dlz.zones";
#include "/usr/local/bind/etc/default.zones";
```

## 步驟 5. 編輯 default.zones

```
sudo vim /usr/local/bind/etc/default.zones
```

```
zone "ddns.idv.tw" IN {  
    type master;  
    file "/usr/local/bind/zones/ddns.idv.tw.zone";  
};  
zone "170.219.18.in-addr.arpa" IN {  
    type master;  
    file "/usr/local/bind/zones/170.219.18.zone";  
};
```

配置 ddns.idv.tw 檔案

```
sudo mkdir /usr/local/bind/zones  
sudo vim /usr/local/bind/zones/ddns.idv.tw
```

```
$TTL 1H  
@    IN    SOA ddns.idv.tw.  admin.ddns.idv.tw. ( 0 1D 1H 1W 3H )  
      NS   ns1.ddns.idv.tw.  
      NS   ns2.ddns.idv.tw.  
      A    18.219.170.145  
      AAAA  ::1  
      MX   10 mx.ddns.idv.tw.  
ttl IN  A    18.219.170.145  
www     IN  A    18.219.170.145  
mx      IN  A    18.219.170.145  
ns1     IN  A    18.219.170.145  
ns2     IN  A    18.219.170.145
```

```
sudo vim /usr/local/bind/zones/170.219.18.zone
```

```
$TTL 2H  
@          IN          SOA      ddns.idv.tw. admin.ddns.idv.tw. ( 0 2H  
10M 7D 1D )
```

		NS	ttl.ddns.idv.tw.
		A	127.0.0.1
		AAAA	::1
22	IN	PTR	ddns.idv.tw
33	IN	PTR	www.ddns.idv.tw.
11	IN	PTR	ns1.ddns.idv.tw.
11	IN	PTR	ns2.ddns.idv.tw.
66	IN	PTR	mx.ddns.idv.tw.

### 第三節 檢查 BIND 設定

```
/usr/local/bind/sbin/named-checkconf -z /usr/local/bind/etc/named.conf
```

```
[ec2-user@ip-172-31-27-5 keys]$ /usr/local/bind/sbin/named-checkconf -z /usr/local/bind/etc/named.conf
zone ddns.idv.tw/IN: loaded serial 0
zone 170.219.18.in-addr.arpa/IN: loaded serial 0
[ec2-user@ip-172-31-27-5 keys]$
```

圖 8 檢查設定

## 步驟 1. 建立 mysql schema

建立一個 MySQL Database “ipv6ddns”

```
CREATE DATABASE /*!32312 IF NOT EXISTS*/ `ipv6ddns`  
/*!40100 DEFAULT CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci */ /*!80016 DEFAULT ENCRYPTION='N' */;
```

```
DROP TABLE IF EXISTS `apikey`;
```

```
CREATE TABLE `apikey` (  
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `apikey` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  PRIMARY KEY (`id`)  
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT  
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;
```

```
# Dump of table db
```

```
# -----
```

```
DROP TABLE IF EXISTS `db`;
```

```
CREATE TABLE `db` (  
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `title` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,  
  `content` text CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci,  
  `created_at` timestamp NULL DEFAULT  
CURRENT_TIMESTAMP,  
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,
```



```

PRIMARY KEY (`id`),
KEY `checkval` (`checkval`),
KEY `ip` (`ip`),
KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

# Dump of table dns_records
# -----

DROP TABLE IF EXISTS `dns_records`;

CREATE TABLE `dns_records` (
  `id` int(32) NOT NULL AUTO_INCREMENT,
  `zone` varchar(255) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `host` varchar(255) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `type` enum('MX','CNAME','NS','SOA','A','PTR','AAAA','TXT')
CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_ci
DEFAULT NULL,
  `data` varchar(1000) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci NOT NULL DEFAULT "",
  `ttl` int(11) DEFAULT '600',
  `mx_priority` int(11) DEFAULT NULL,
  `refresh` int(11) DEFAULT '600',
  `retry` int(11) DEFAULT NULL,
  `expire` int(11) DEFAULT '86400',
  `minimum` int(11) DEFAULT '3600',
  `serial` bigint(20) DEFAULT '2020091601',
  `resp_person` varchar(1000) CHARACTER SET utf8mb4
COLLATE utf8mb4_unicode_ci DEFAULT "",
  `primary_ns` varchar(1000) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT "",
  `dynaload` tinyint(1) DEFAULT '0',
  `datestamp` datetime DEFAULT NULL,

```

```

`regnumber` varchar(64) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT '0000000',
`created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
`updated_at` timestamp NULL DEFAULT NULL ON UPDATE
CURRENT_TIMESTAMP,
PRIMARY KEY (`id`),
KEY `host_index` (`host`),
KEY `zone_index` (`zone`),
KEY `type_index` (`type`)
) ENGINE=InnoDB AUTO_INCREMENT=13 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

```

# Dump of table email

# -----

```
DROP TABLE IF EXISTS `email`;
```

```

CREATE TABLE `email` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `sender` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `receiver` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `title` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `content` text CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),

```

```

    KEY `ip` (`ip`),
    KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

# Dump of table inactive_zones
# -----

DROP TABLE IF EXISTS `inactive_zones`;

CREATE TABLE `inactive_zones` (
  `zone` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci NOT NULL DEFAULT ''
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

# Dump of table ipdata
# -----

DROP TABLE IF EXISTS `ipdata`;

CREATE TABLE `ipdata` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `country_code` varchar(5) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `locale` varchar(10) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `currency` varchar(10) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `latitude` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `longitude` varchar(191) CHARACTER SET utf8mb4 COLLATE

```

```

utf8mb4_unicode_ci DEFAULT NULL,
  `currency_symbol` varchar(10) CHARACTER SET utf8mb4
COLLATE utf8mb4_unicode_ci DEFAULT NULL,
  `in_eu` int(11) DEFAULT NULL,
  `region` varchar(50) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `regioncode` varchar(50) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `city` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `time_zone` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `updated_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`),
  KEY `ip` (`ip`),
  KEY `country_code` (`country_code`),
  KEY `locale` (`locale`),
  KEY `currency` (`currency`),
  KEY `updated_at` (`updated_at`),
  KEY `latitude` (`latitude`),
  KEY `longtiude` (`longtiude`),
  KEY `currency_symbol` (`currency_symbol`),
  KEY `in_eu` (`in_eu`),
  KEY `region` (`region`),
  KEY `regioncode` (`regioncode`),
  KEY `city` (`city`),
  KEY `time_zone` (`time_zone`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table ipfail

```

```

# -----

```

```

DROP TABLE IF EXISTS `ipfail`;

```

```
CREATE TABLE `ipfail` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;
```

```
# Dump of table login
```

```
# -----
```

```
DROP TABLE IF EXISTS `login`;
```

```
CREATE TABLE `login` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `email` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `email` (`email`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;
```

```
# Dump of table loginfail
```

```
# -----
```

```
DROP TABLE IF EXISTS `loginfail`;
```

```
CREATE TABLE `loginfail` (
```

```
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
```

```
  `email` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,
```

```
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,
```

```
  `created_at` timestamp NULL DEFAULT
```

```
CURRENT_TIMESTAMP,
```

```
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE  
utf8mb4_unicode_ci DEFAULT NULL,
```

```
  PRIMARY KEY (`id`),
```

```
  KEY `checkval` (`checkval`),
```

```
  KEY `email` (`email`),
```

```
  KEY `ip` (`ip`),
```

```
  KEY `ctime` (`created_at`)
```

```
) ENGINE=InnoDB AUTO_INCREMENT=1783 DEFAULT
```

```
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;
```

```
# Dump of table meta_data
```

```
# -----
```

```
DROP TABLE IF EXISTS `meta_data`;
```

```
CREATE TABLE `meta_data` (
```

```
  `next_id` int(8) NOT NULL
```

```
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
```

```
COLLATE=utf8mb4_unicode_ci;
```

```

# Dump of table other
# -----

DROP TABLE IF EXISTS `other`;

CREATE TABLE `other` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `ip` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `title` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `content` text CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `checkval` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  PRIMARY KEY (`id`),
  KEY `checkval` (`checkval`),
  KEY `ip` (`ip`),
  KEY `ctime` (`created_at`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

# Dump of table replication_heartbeat
# -----

DROP TABLE IF EXISTS `replication_heartbeat`;

CREATE TABLE `replication_heartbeat` (
  `timestamp` timestamp NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

```

# Dump of table users
# -----

DROP TABLE IF EXISTS `users`;

CREATE TABLE `users` (
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `email` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `firstname` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `lastname` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `pw` varchar(250) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `avator` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `created_at` timestamp NULL DEFAULT
CURRENT_TIMESTAMP,
  `temp_pw` varchar(250) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `temp_pw_created` timestamp NULL DEFAULT NULL,
  `temp_pw_expired` timestamp NULL DEFAULT NULL,
  `verify_code` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci DEFAULT NULL,
  `is_verified` tinyint(1) DEFAULT '0',
  `is_deleted` tinyint(3) unsigned DEFAULT '0',
  PRIMARY KEY (`id`),
  UNIQUE KEY `email` (`email`),
  KEY `firstname` (`firstname`),
  KEY `lastname` (`lastname`),
  KEY `is_verified` (`is_verified`),
  KEY `verify_code` (`verify_code`),
  KEY `is_deleted` (`is_deleted`)
) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT
CHARSET=utf8mb4 COLLATE=utf8mb4_unicode_ci;

```



```

# Dump of table xfr_table
# -----

DROP TABLE IF EXISTS `xfr_table`;

CREATE TABLE `xfr_table` (
  `zone` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci NOT NULL,
  `client` varchar(191) CHARACTER SET utf8mb4 COLLATE
utf8mb4_unicode_ci NOT NULL,
  KEY `zone_client_index` (`zone`,`client`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

CREATE TABLE IF NOT EXISTS acl (
  id int(10) unsigned NOT NULL AUTO_INCREMENT,
  zone varchar(192) NOT NULL,
  client varchar(192) NOT NULL,
  PRIMARY KEY (id),
  KEY client (client),
  KEY zone (zone)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_unicode_ci;

```

## 步驟 2. 放資料進入 MySQL

```
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', 'www', 'A', '18.219.170.145', '600' );  
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', 'mail', 'CNAME', 'www', '600' );  
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', '@', 'NS', 'ns1', '60' );  
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', 'ns1', 'A', '18.219.170.145', '600' );  
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', '@', 'NS', 'ns2', '60' );  
INSERT INTO dns_records ( zone, HOST, type, DATA, ttl ) VALUES  
( 'ddns.idv.tw', 'ns2', 'A', '18.219.170.145', '600' );
```

#### 第四節 測試 BIND 及 MySQL

### 步驟 1. 檢查設定檔案(除錯模式)

```
sudo /usr/local/bind/sbin/named -g -c /usr/local/bind/etc/named.conf
```

[illegible]

圖 9 啟動 named

24-Sep-2020 07:30:57.412 starting BIND 9.16.4 (Stable Release)  
<id:0849b42>  
24-Sep-2020 07:30:57.412 running on Linux x86\_64  
4.14.193-149.317.amzn2.x86\_64 #1 SMP Thu Sep 3 19:04:44 UTC  
2020  
24-Sep-2020 07:30:57.412 built with '--prefix=/usr/local/bind/'  
'--enable-threads=no' '--with-dlz-mysql' '--with-openssl'  
24-Sep-2020 07:30:57.412 running as: named -g -c  
/usr/local/bind/etc/named.conf  
24-Sep-2020 07:30:57.412 compiled by GCC 7.3.1 20180712 (Red Hat  
7.3.1-9)  
24-Sep-2020 07:30:57.412 compiled with OpenSSL version: OpenSSL  
1.0.2k-fips 26 Jan 2017  
24-Sep-2020 07:30:57.412 linked to OpenSSL version: OpenSSL  
1.0.2k-fips 26 Jan 2017

24-Sep-2020 07:30:57.412 compiled with zlib version: 1.2.7  
24-Sep-2020 07:30:57.412 linked to zlib version: 1.2.7  
24-Sep-2020 07:30:57.412 -----  
24-Sep-2020 07:30:57.412 BIND 9 is maintained by Internet Systems Consortium,  
24-Sep-2020 07:30:57.412 Inc. (ISC), a non-profit 501(c)(3)  
public-benefit  
24-Sep-2020 07:30:57.412 corporation. Support and training for  
BIND 9 are  
24-Sep-2020 07:30:57.412 available at <https://www.isc.org/support>  
24-Sep-2020 07:30:57.412 -----  
24-Sep-2020 07:30:57.412 adjusted limit on open files from 4096 to  
1048576  
24-Sep-2020 07:30:57.412 found 1 CPU, using 1 worker thread  
24-Sep-2020 07:30:57.412 using 1 UDP listener per interface  
24-Sep-2020 07:30:57.412 using up to 21000 sockets  
24-Sep-2020 07:30:57.416 loading configuration from  
'/usr/local/bind/etc/named.conf'  
24-Sep-2020 07:30:57.416 reading built-in trust anchors from file  
'/usr/local/bind/etc/bind.keys'  
24-Sep-2020 07:30:57.416 using default UDP/IPv4 port range: [32768,  
60999]  
24-Sep-2020 07:30:57.416 using default UDP/IPv6 port range: [32768,  
60999]  
24-Sep-2020 07:30:57.416 listening on IPv4 interface lo, 127.0.0.1#53  
24-Sep-2020 07:30:57.420 listening on IPv4 interface eth0,  
172.31.11.44#53  
24-Sep-2020 07:30:57.420 listening on IPv6 interface lo, ::1#53  
24-Sep-2020 07:30:57.420 generating session key for dynamic DNS  
24-Sep-2020 07:30:57.420 sizing zone task pool based on 0 zones  
24-Sep-2020 07:30:57.420 Loading 'Mysql zone' using driver mysql  
24-Sep-2020 07:30:57.420 none:98: 'max-cache-size 90%' - setting to  
885MB (out of 983MB)  
24-Sep-2020 07:30:57.424 obtaining root key for view \_default from  
'/usr/local/bind/etc/bind.keys'  
24-Sep-2020 07:30:57.424 set up managed keys zone for view \_default,  
file 'managed-keys.bind'  
24-Sep-2020 07:30:57.424 automatic empty zone: 10.IN-ADDR.ARPA

24-Sep-2020 07:30:57.424 automatic empty zone:  
16.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
17.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
18.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
19.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
20.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
21.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
22.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
23.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
24.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
25.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
26.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
27.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
28.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
29.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
30.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
31.172.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
168.192.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
64.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
65.100.IN-ADDR.ARPA

24-Sep-2020 07:30:57.424 automatic empty zone:  
66.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
67.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
68.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
69.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
70.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
71.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
72.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
73.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
74.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
75.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
76.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
77.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
78.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
79.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
80.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
81.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
82.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
83.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
84.100.IN-ADDR.ARPA

24-Sep-2020 07:30:57.424 automatic empty zone:  
85.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
86.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
87.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
88.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
89.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
90.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
91.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
92.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
93.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
94.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
95.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
96.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
97.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
98.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.424 automatic empty zone:  
99.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
100.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
101.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
102.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
103.100.IN-ADDR.ARPA

24-Sep-2020 07:30:57.428 automatic empty zone:  
104.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
105.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
106.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
107.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
108.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
109.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
110.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
111.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
112.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
113.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
114.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
115.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
116.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
117.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
118.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
119.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
120.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
121.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
122.100.IN-ADDR.ARPA



24-Sep-2020 07:30:57.428 automatic empty zone:  
123.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
124.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
125.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
126.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
127.100.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: 0.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
127.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
254.169.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
2.0.192.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
100.51.198.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
113.0.203.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
255.255.255.255.IN-ADDR.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
0.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
1.0.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: D.F.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: 8.E.F.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: 9.E.F.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: A.E.F.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: B.E.F.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
8.B.D.0.1.0.0.2.IP6.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone:  
EMPTY.AS112.ARPA  
24-Sep-2020 07:30:57.428 automatic empty zone: HOME.ARPA  
24-Sep-2020 07:30:57.428 none:98: 'max-cache-size 90%' - setting to

885MB (out of 983MB)  
24-Sep-2020 07:30:57.432 command channel listening on  
127.0.0.1#953  
24-Sep-2020 07:30:57.432 not using config file logging statement for  
logging due to -g option  
24-Sep-2020 07:30:57.432 managed-keys-zone: loaded serial 2  
24-Sep-2020 07:30:57.436 all zones loaded  
24-Sep-2020 07:30:57.436 running  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:9f::42#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:2::c#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:2f::f#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:7fd::1#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:503:ba3e::2:30#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:a8::e#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:7fe::53#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:12::d0d#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:dc3::35#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:2d::d#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:503:c27::2:30#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:1::53#53  
24-Sep-2020 07:30:57.436 network unreachable resolving './NS/IN':  
2001:500:200::b#53  
24-Sep-2020 07:30:57.472 managed-keys-zone: Key 20326 for zone . is  
now trusted (acceptance timer complete)  
24-Sep-2020 07:30:58.028 resolver priming query complete

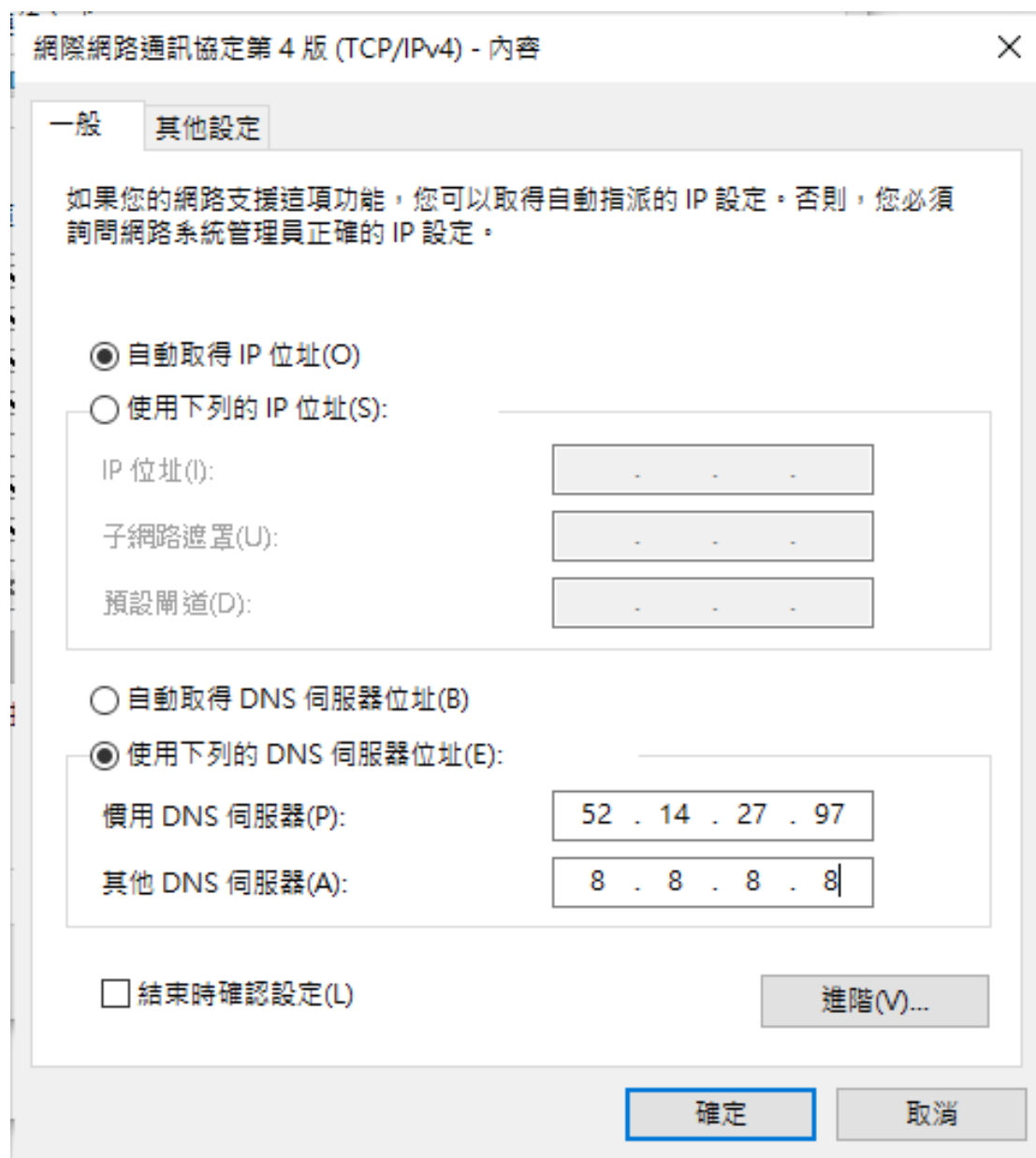


圖 10 Windows 指定 DNS

## 步驟 2. 正式啟動 named

```
/usr/local/bind/sbin/named -c /usr/local/bind/etc/named.conf
```

### 步驟 3. 修改 resolv.conf 檔案，指定 name server

```
sudo vim /etc/resolv.conf
```

```
nameserver 8.8.8.8  
nameserver 8.8.4.4  
  
nameserver 18.219.170.145 #新增加(加在最後一行)
```

### 步驟 4. 測試 DNS server 是否可以正常回應

```
dig @localhost www.ddns.idv.tw  
dig @localhost google.com  
dig @localhost ns1.ddns.idv.tw  
dig @localhost ns2.ddns.idv.tw  
host ddns.idv.tw localhost  
host ns1.ddns.idv.tw localhost  
host ns2.ddns.idv.tw localhost
```

```
[ec2-user@ip-172-31-27-5 ~]$ dig @localhost www.ddns.idv.tw  
  
; <<>> DiG 9.11.4-P2-RedHat-9.11.4-9.P2.amzn2.0.4 <<>> @localhost www.ddns.idv.tw  
; (1 server found)  
;; global options: +cmd  
;; Got answer:  
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 33692  
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags:; udp: 4096  
;; QUESTION SECTION:  
;www.ddns.idv.tw.                IN      A  
  
;; ANSWER SECTION:  
www.ddns.idv.tw.                3600    IN      A      18.219.170.145  
  
;; Query time: 61 msec  
;; SERVER: 127.0.0.1#53(127.0.0.1)  
;; WHEN: 日 10月 18 13:44:03 UTC 2020  
;; MSG SIZE rcvd: 60  
  
[ec2-user@ip-172-31-27-5 ~]$
```

圖 11 測試 dig 輸出

```
[ec2-user@ip-172-31-27-5 ~]$ host ns1.ddns.idv.tw localhost
Using domain server:
Name: localhost
Address: 127.0.0.1#53
Aliases:

ns1.ddns.idv.tw has address 18.219.170.145
[ec2-user@ip-172-31-27-5 ~]$
```

圖 12 檢查 ns1 輸出

找一台電腦，修改 DNS，測試看是否可以運作(把 18.219.170.145 加入)

```
nameserver 127.0.0.1
nameserver 8.8.8.8
nameserver 8.8.4.4
nameserver 18.219.170.145
```

```
(base) linweiting@mac-317:~$ nslookup ns1.ddns.idv.tw
Server:          127.0.0.1
Address:         127.0.0.1#53

Non-authoritative answer:
Name:   ns1.ddns.idv.tw
Address: 18.219.170.145
```

## 第五節 安裝 DDNS 管理平台

```
cd /var/www/  
sudo chown ec2-user:ec2-user html  
cd html  
  
git clone https://github.com/tripbnb66/ipv6ddns.git #解壓縮原始檔案  
cd ipv6ddns  
  
composer install #安裝所需 packages  
  
cd cron/  
  
./new_cache.sh #產生 cache 目錄, 設定權限  
  
http://www.ddns.idv.tw/
```

## 步驟 1. 編輯/etc/nginx/conf.d/檔案

ddns.conf

```
server {  
    server_name www.dns.idv.tw;  
    include 'conf.d/ddns.base';  
}
```

ddns.base

```
root    /var/www/html/ipv6ddns;  
set $fastcgi_backend "127.0.0.1:9000";  
#set $fastcgi_backend unix:/var/run/php-fpm/www.sock;  
client_max_body_size 80M;  
charset utf-8;  
gzip on;  
gzip_disable "msie6";  
server_tokens off;  
  
fastcgi_buffer_size 128k;  
fastcgi_buffers 4 256k;  
fastcgi_busy_buffers_size 256k;  
  
gzip_vary on;  
gzip_proxied any;  
gzip_comp_level 6;  
gzip_http_version 1.1;  
gzip_min_length 256;  
gzip_types text/plain text/css application/json  
application/x-javascript text/xml application/xml application/xml+rss  
text/javascript application/  
javascript application/vnd.ms-fontobject application/x-font-ttf  
font/opentype image/svg+xml image/x-icon;  
  
index index.php index.html index.htm;  
if ($request_uri ~ 'favicon') {  
    return 404;  
}
```



```
location ~/cron/(.*) {
    deny all;
}
location ~/install/(.*) {
    deny all;
}
location / {
    try_files $uri $uri/ /index.php?$args =404;
}
error_page 404 /40x.html;
error_page 500 502 503 504 /50x.html;
location ~ \.php$ {
    try_files $uri =404;
    fastcgi_pass $fastcgi_backend;
    fastcgi_index index.php;
    fastcgi_param SCRIPT_FILENAME
$document_root$fastcgi_script_name;
    include fastcgi_params;
}

client_body_timeout 5s;
client_header_timeout 5s;
```

你需要在你當初購買網域的服務商，將原本代管的 name server 指向自己架設的 DDNS Server，這樣之後的主機名稱解析，就會由你架設的 DDNS Server 處理。

以 PCHome 為例，進入到 PCHome 的網頁之後，選擇「自管 DNS」，然後填入你自己的 name server 名稱，然後儲存。靜待 24 至 48 小時之後，設定就會生效。

管理我的網址 ▾ | 購買與續用 ▾ | 價格與教學 ▾ | 工具使用 ▾ | 尋求幫助 ▾

PCHome > 買網址 管理我的網址

### 設定DNS

您的網域名稱：**ddns.idv.tw**

☒ 自管DNS ☐ PChome代管DNS ☐ 動態DNS ☐ Page Parking ☐ 一站式功能

[進階DNSSEC設定](#) [網站啟用IPv6設定|教學](#) [DNS 自管設定說明](#) [圖例教學](#)

自管DNS		
表示不會透過 PChome 解析您的網址，而是您自己的 DNS 對外回應指向(權威回答)，請確定您的伺服器有 DNS 功能後再填入以下資料，若單純只是有固定 IP 的 web 伺服器，請改選擇 (PChome代管DNS) 使用 A 紀錄來對應		
Name Server (NS)	IP 位址	IPv6 位址
ns1.ddns.idv.tw	52.14.27.97	
ns2.ddns.idv.tw	52.14.27.97	

圖 13 PCHome 設定自管 DNS