

PmaControl [GeoIP](#) [mmdb](#) [IPv4](#) [IPv6](#)

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Introduction

100+ MariaDB/MySQL

MaxMind GeoLite2 IP lookup.....

- HTTP 70MB
- 100 100 lookup
-
- PHP-FPM worker

PmaControl server/main AJAX.mmd 100

MariaDB

GeoLite2 ranges MariaDB SQL

SQL

```
CREATE TABLE data_geoip (  
  id INT AUTO_INCREMENT PRIMARY KEY,  
  network_start VARBINARY(16) NOT NULL,  
  network_end VARBINARY(16) NOT NULL,  
  country_iso CHAR(2) NOT NULL DEFAULT '',  
  country_name VARCHAR(100) NOT NULL DEFAULT '',  
  INDEX idx_network_start (network_start)  
) ENGINE=InnoDB;
```

VARBINARY(16) 十六字节

- **4** 字节 IPv4 32 位
- **16** 字节 IPv6 128 位
- VARBINARY(16) 十六字节
- INET6_ATON() 将 IPv4 或 v6 地址转换为十六进制

Lookup

```
SELECT country_iso FROM data_geoip  
WHERE network_start <= INET6_ATON('89.30.104.134')  
AND network_end >= INET6_ATON('89.30.104.134')  
LIMIT 1;
```

FR 1ms

十六字节 IPv6

```
SELECT country_iso FROM data_geoip  
WHERE network_start <= INET6_ATON('2001:4860:4860::8888')  
AND network_end >= INET6_ATON('2001:4860:4860::8888')  
LIMIT 1;
```

US 1ms — Google DNS

IP

IPv4 0.0.0.0 255.255.255.255

IPv4 $2^{32} = 43$ `MaxMinReader()` CIDR

```
$ip = 0;
while ($ip <= 4294967295) {
    [$record, $prefixLen] = $reader->getWithPrefixLen(long2ip($ip));

    // 
    $networkSize = 1 << (32 - $prefixLen);
    $networkEnd = $ip + $networkSize - 1;

    if ($record && !empty($record['country']['iso_code'])) {
        // INSERT data_geoip
    }

    // CIDR 
    $ip = $networkEnd + 1;
}
```

650,000 ranges `range(0, 255.255.0, 255.255.0, 255.255.0, 255.255.0)`

IPv6 2000::/3

IPv6 2^{128} `2000::/3` `Global Unicast` `Gen3` 748

16

```
$current = inet_pton('2000::');
$end6    = inet_pton('3fff:ffff:ffff:ffff:ffff:ffff:ffff:ffff');

while ($current <= $end6) {
    [$record, $prefixLen] = $reader->getWithPrefixLen(inet_ntop($current));
    $endBin = binNetworkEnd($current, $prefixLen);

    if ($record && !empty($record['country']['iso_code'])) {
        // INSERT UNHEX(bin2hex(...))
    }

    $current = binIncrement($endBin); // 128 +1
}
```

128 PHP GMP

```
// 1 IPv6 1
function binIncrement(string $bin): string|false
{
    $bytes = unpack('C16', $bin);
    for ($i = 15; $i >= 0; $i--) {
        $bytes[$i]++;
        if ($bytes[$i] <= 255) return pack('C16', ...$bytes);
        $bytes[$i] = 0; // 1
    }
    return false; // 1
}
```

11111111

111

1	IPv4	IPv6	11
data_geoiip 1111	~650K	~180K	~830K ranges
data_geoiip_city 1111	~3.7M	~1.2M	~4.9M ranges

11

11	11
111111 IPv4 + IPv6	~30 11
111111 IPv4 + IPv6	~5 11
11 1 1 IP	< 1 ms
11 100 1 IP server/main 11	11 ~15 ms
AJAX 11111111	11111

1111

1 PmaControl 111111111111 IP 1111111 emoji

```
89.30.104.134:3306 PIXID-MDB-MASTER1
136.243.1.1:3306 Hetzner-Slave
210.171.224.1:3306 NTT-Tokyo
8.8.8.8:3306 Google-Test
```

IP 10.x 172.16-31.x 192.168.x 127.x GeoLite2

MaxMind GeoLite2

```
# .mmdb data/
#
php App/Webroot/index.php server loadGeoip # ~30
php App/Webroot/index.php server loadGeoipCity # ~5
```

TRUNCATE diff

data_geoip_city GPS

```
SELECT country_iso, region_name, city, latitude, longitude, time_zone
FROM data_geoip_city
WHERE network_start <= INET6_ATON('136.243.1.1')
AND network_end >= INET6_ATON('136.243.1.1')
LIMIT 1;
```

DE | Saxony | Falkenstein | 50.4779 | 12.3713 | Europe/Berlin

LEFT JOIN

```
LEFT JOIN data_geoip g ON g.network_start <= INET6_ATON(s.ip) AND g.network_end >=
INET6_ATON(s.ip) 650K ranges N lookup IP
```

GeoLite2 MariaDB Locks 1 ms IPv6 INSERT

GitHub