# **TWNIC Update**

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APNIC 49

# Outline

- Statistics of TWNIC's IP members

- TWNIC's activities and training programs

- TWNIC RPKI Update

- Conclusions & Future Works

# Statistics of TWNIC's IP Members

**TWNIC**

**TWNIC 's Member: 292**

| 代理發放單位 | | 代理發放單位 | | 代理發放單位 |
|---|---|---|---|---|
| 1 | | 22 | 台灣基礎開發科技股份有限公司 | 43 | 筌城有限公司 |
| 2 | | 23 | 中嘉和網股份有限公司 | 44 | 威達雲端電訊股份有限公司 |
| 3 | | 24 | 世新有線電視股份有限公司 | 45 | 安源通訊股份有限公司 |
| 4 | | 25 | 台灣恩悌悌股份有限公司 | 46 | 大眾電信股份有限公司 |
| 5 | | 26 | 大台北寬頻網路股份有限公司 | 47 | 大同電信股份有限公司 |
| 6 | | 27 | 易達通網路系統有限公司 | 48 | 威邁思電信股份有限公司 |
| 7 | 太聯科技股份有限公司 | 28 | 數位通國際網路股份有限公司 | 49 | 全球一動股份有限公司 |
| 8 | 遠傳電信股份有限公司 | 29 | 大無畏寬頻股份有限公司 | 50 | 洞灣有線電視股份有限公司 |
| 9 | 宏遠電訊股份有限公司 | 30 | | | |
| 10 | 向邦網路科技股份有限公司 | 31 | | | |
| 11 | 博訊科技股份有限公司 | 32 | | | |
| 12 | 和宇寬頻網路股份有限公司 | 33 | | | |
| 13 | 協志科技股份有限公司 | 34 | | | |
| 14 | 新世紀資通股份有限公司 | 35 | | | |
| 15 | 新 | 36 | | | |
| 16 | | 37 | | | |
| 17 | | 38 | | | |
| 18 | | 39 | | | |
| 19 | | 40 | | | |
| 20 | 台灣 | 41 | | | |
| 21 | 台灣碩網網路娛樂股份有限公司 | 42 | 采豈科技股份有限公司 | | |

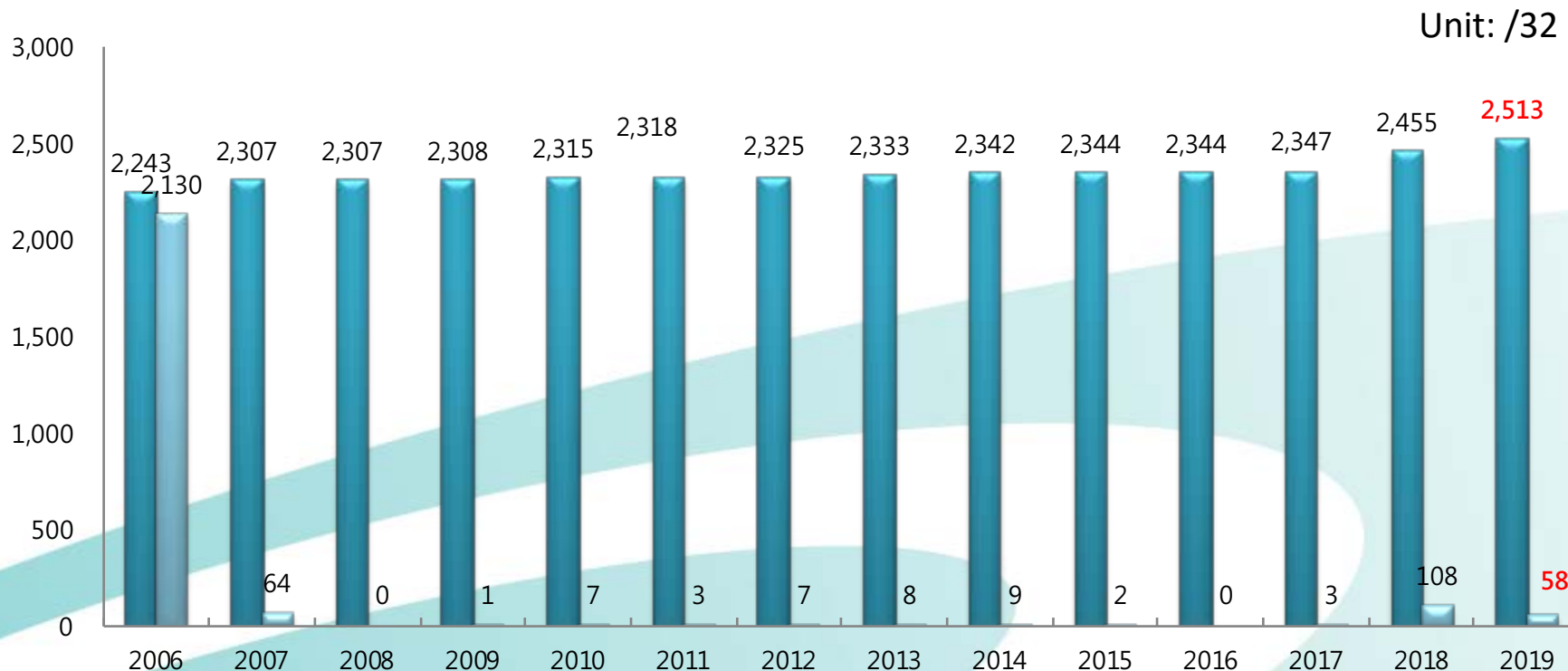| Service Types | # of TWNIC's Members |
|---|---|
| Co-location/IDC | 64 |
| FTTx | 18 |
| ADSL | 4 |
| Cable Modem | 25 |
| WLAN | 2 |
| 3G/3.5G | 5 |
| 4G(LTE) | 5 |

# IPv4 Address Allocation

- TWNIC has allocated 132,728 /24s IPv4 addresses

Unit: /24
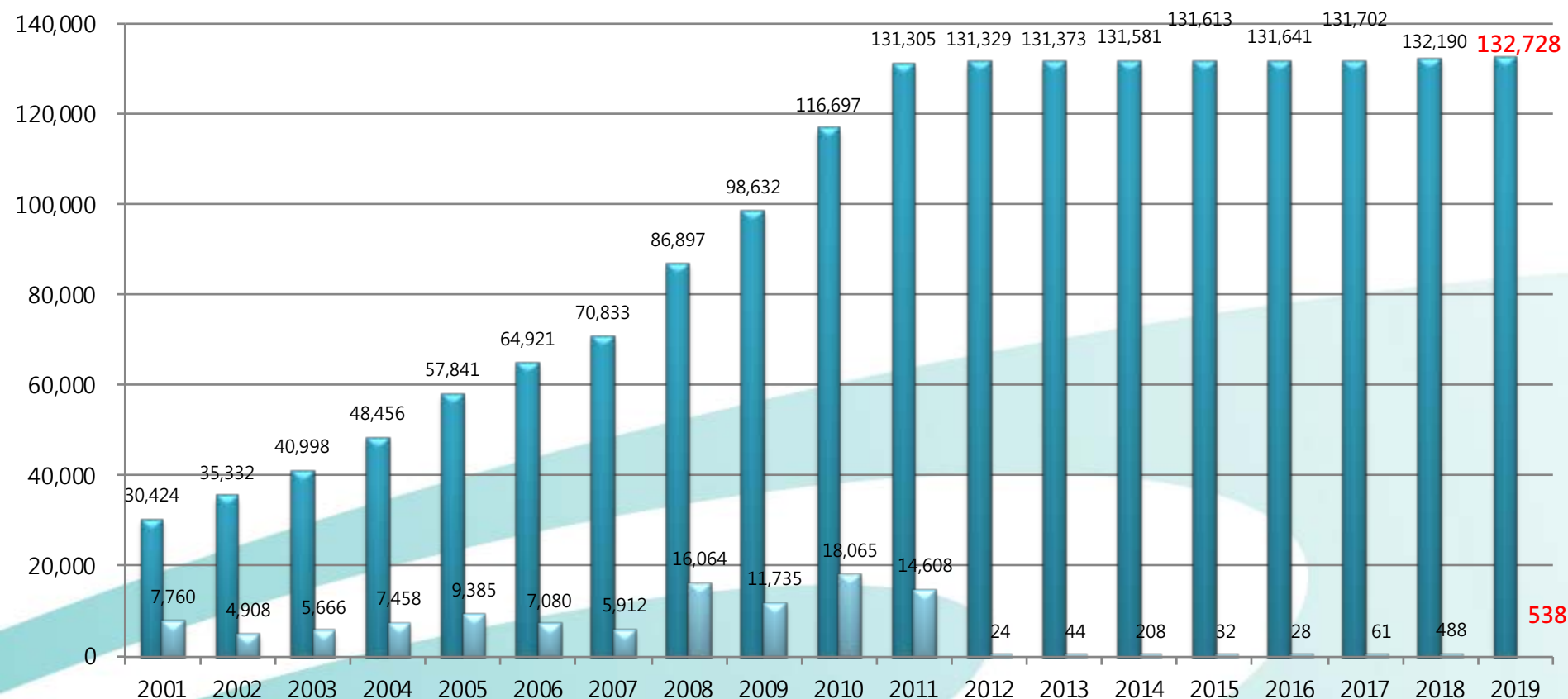
# IPv6 Address Allocation

- TWNIC has allocated 2,513 /32s IPv6 addresses
- Most of TWNIC IP members have obtained IPv6 addresses.

Unit: /32

# 33rd TWNIC IP Open Policy Meeting



- Time: December 5, 2019
- Keynote speech:
  - **The Future of IP Address Registries in Internet Governance** Paul Wilson, Director General, APNIC
  - **Legal cooperation to overcome jurisdictional and territorial limits in cybercrime investigations** Che-Hoo Cheng, Infrastructure & Development Director, APNIC
- Session topics include Cooperation SIG, Policy SIG, IPv6 Deployment SIG and Cyber Security SIG etc.
- To see the detail agenda, visit https://opm.twnic.net.tw/33rd/agenda.html

# 2019 TWNIC-APNIC Joint Training - Routing Security Workshop

- Time: December 9-11, 2019
- Attendee: 33
- Lecturer: Sheryl Hermoso, APNIC and Muzamer Mohd Azalan, Community Trainer
- Course outline

  - Internet Routing Basics (recap)
  - BGP Fundamentals (recap)
  - BGP Attributes and Policy Control
  - BGP Operations and Security best practices
  - BGP Filtering techniques
  - Resource PKI fundamentals
  - BGP Filtering with ROA (Route Origin Validation)
  - BGP AS-path validation



- This workshop will look at current tools/techniques, how RPKI is just a piece in the puzzle, and what we should to secure the internet routing instead of waiting for an ideal solution that fixes all issues.

- This workshop is not an introduction. The lab exercises use Cisco IOS configuration syntax
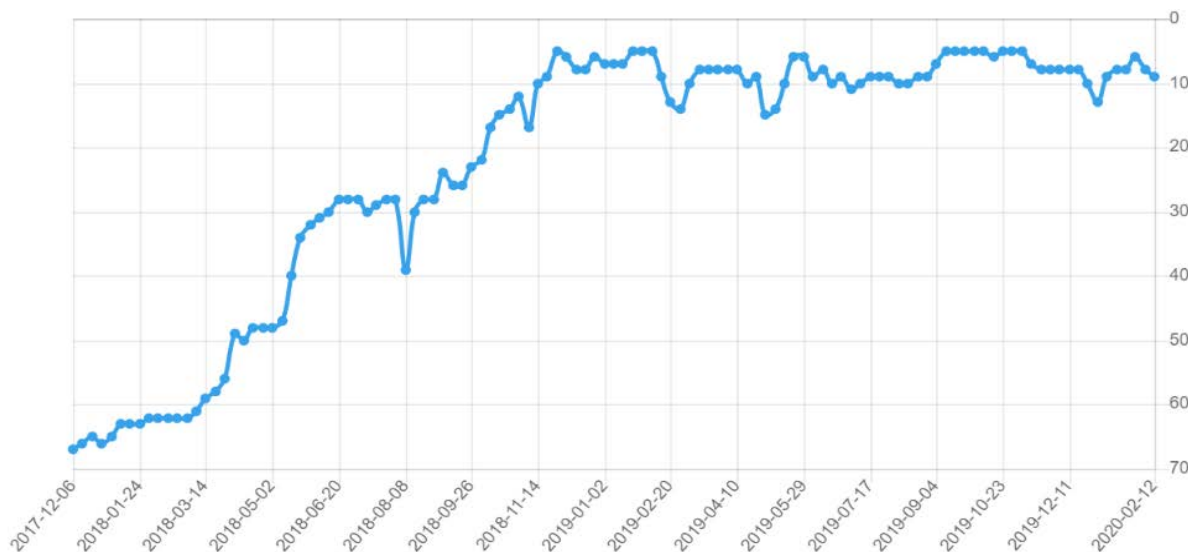
# Taiwan IPv6 User Availability

● Taiwan IPv6 user availability is 0.46% in the end of 2017 and 42% in February, 2020.

**Taiwan IPv6 Global Ranking: 9**

2020-02-12 —台灣全球排名：9名 (IPv6比例: 42.4%)

Data derived from APNIC by measuring mean value of IPv6 Capable over the last 7 days.    Top 30 List

資料顯示週期：○ 月 ◉ 週 ○ 日

# TWNIC RPKI Training

- 4 times TWNIC RPKI training in 2019.
- The ROA coverage is increased after each training course.
- RPKI Training Outline
  - ❑ RPKI Introduction
  - ❑ RPKI Validator Introduction
  - ❑ RPKI Management System
  - ❑ RPKI Router Configuration
  - ❑ Valid/Invalid Case Study

# Taiwan RPKI Global Ranking

## Taiwan RPKI Global Ranking: 9

——台灣全球排名：9名 (RPKI比例: 96.92%)

**Top 30 List**



| SN | CC | Display Name | RPKI % |
|----|----|--------------|--------|
| 1 | VC | Saint Vincent and the Grenadines | 100 |
| 2 | MH | Marshall Islands | 100 |
| 3 | FK | Falkland Islands | 100 |
| 4 | BL | Saint Barthelemy | 100 |
| 5 | AP | African Regional Industrial Property Organization | 100 |
| 6 | AD | Andorra | 100 |
| 7 | LK | Sri Lanka | 99.06 |
| 8 | EC | Ecuador | 98.97 |
| 9 | TW | Taiwan | 96.92 |
| 10 | MV | Maldives | 96.76 |
| 11 | GF | French Guiana | 96.55 |
| 12 | FO | Faroe Islands | 95.35 |
| 13 | YE | Yemen | 95.14 |
| 14 | BT | Bhutan | 93.75 |
| 15 | TR | Turkey | 93.48 |

Data Source: RIPE NCC, chart by TWNIC on 9 February, 2019

# Taiwan RPKI Asia Ranking

## Taiwan RPKI Asia Ranking: 2

—台灣亞洲排名：2名 (RPKI比例: 96.92%)

**Top 30 List**

| SN | CC | Display Name | RPKI % |
|----|----|-----|-----|
| 1 | LK | Sri Lanka | 99.06 |
| 2 | TW | Taiwan | 96.92 |
| 3 | MV | Maldives | 96.76 |
| 4 | YE | Yemen | 95.14 |
| 5 | BT | Bhutan | 93.75 |
| 6 | TR | Turkey | 93.48 |
| 7 | NP | Nepal | 93.02 |
| 8 | IR | Iran (Islamic Republic of Iran) | 87.15 |
| 9 | PH | Philippines | 83.85 |
| 10 | GE | Georgia | 82.47 |
| 11 | BD | Bangladesh | 81.48 |
| 12 | MM | Myanmar | 69.6 |
| 13 | LA | Lao People's Democratic Republic | 68.46 |
| 14 | IQ | Iraq | 65.9 |
| 15 | CY | Cyprus | 59.36 |

Data Source: RIPE NCC, chart by TWNIC on 9 February, 2019

# Conclusions & Future Works

- TWNIC have 54 more members in 2019.
- We encourage and help the Taiwan ISP and service provider to manage the ROA to increase the ROA coverage gradually.
- We will hold the IPv6、RPKI training and activities this year.
- Welcome to attend the APNIC IPv6 Deployment session this afternoon.

# Thank You