

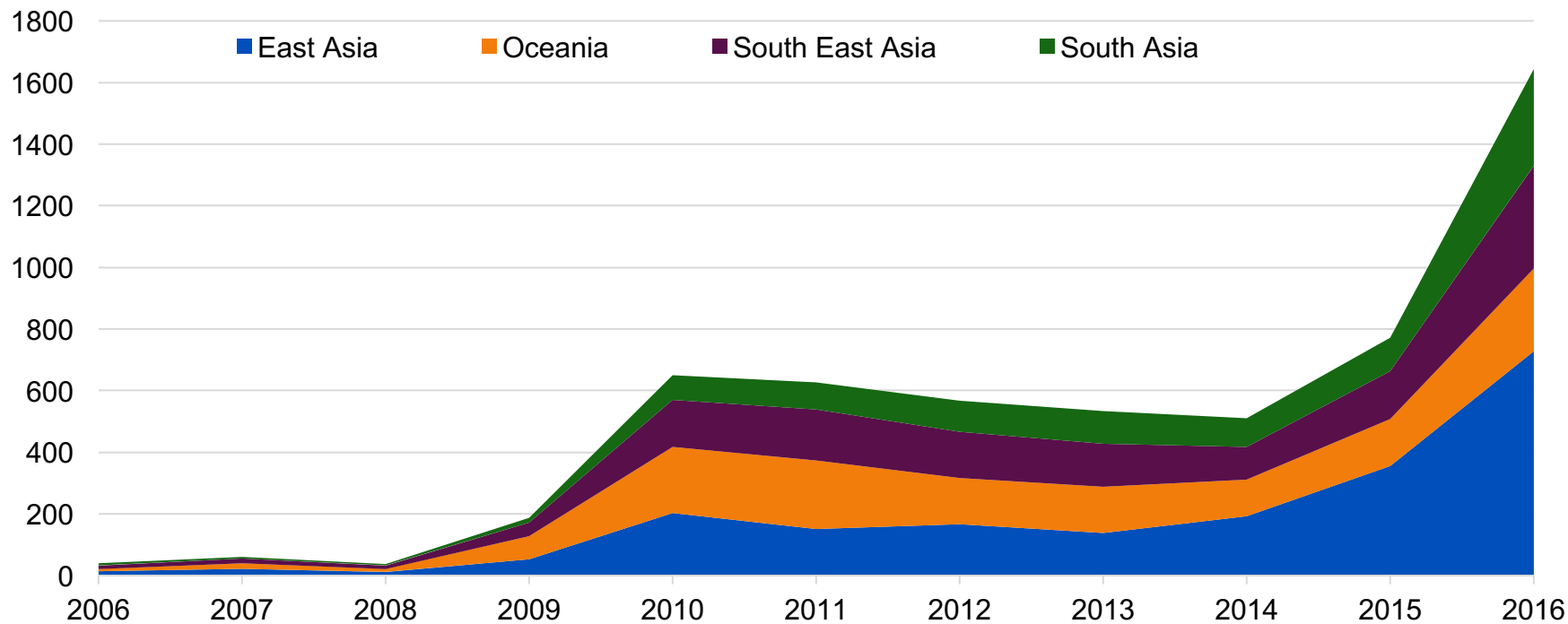
# APNIC Update

Geoff Huston

ARIN 39, 4 April 2017

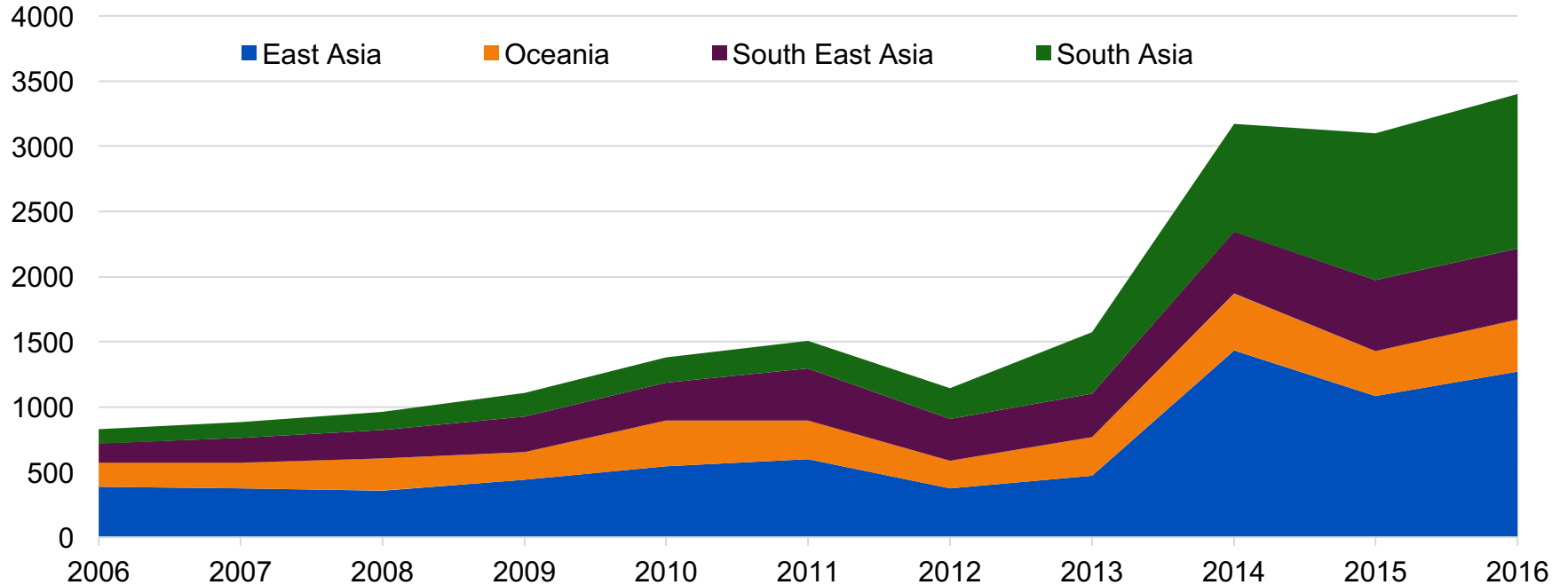
# Just the Highlights

# Annual IPv6 Delegations



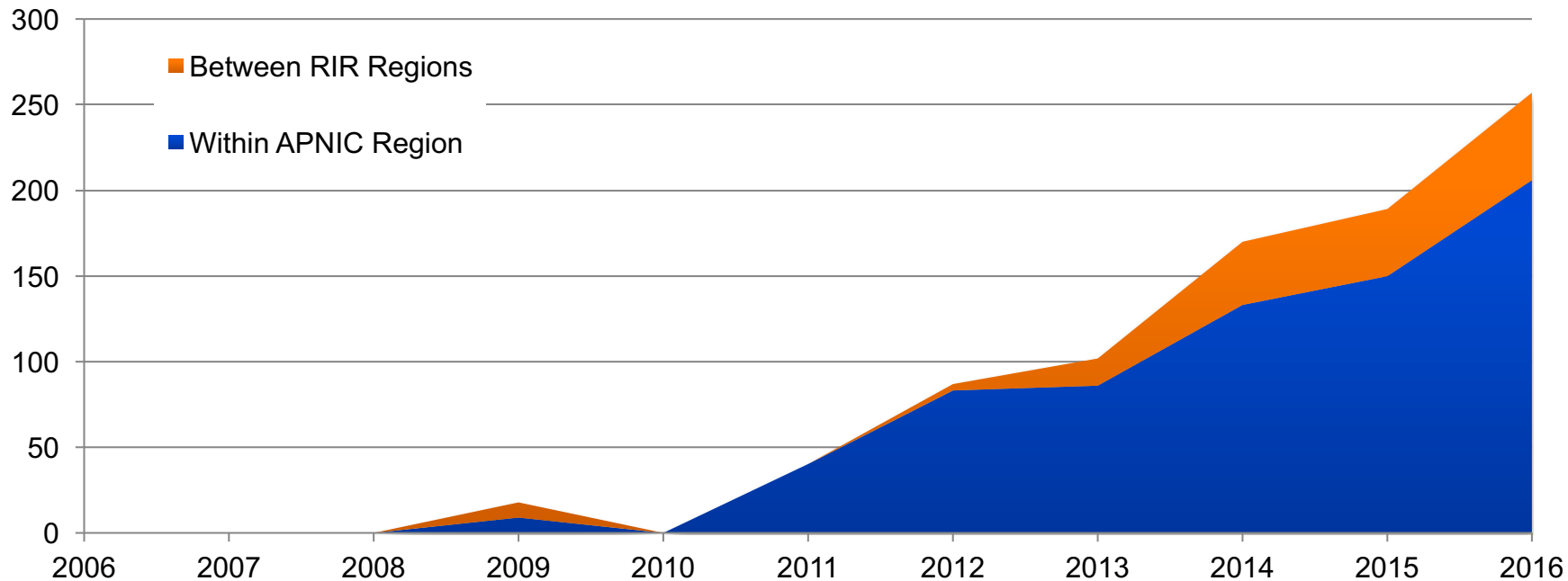
As at 31 December

# Annual IPv4 Delegations



As at 31 December

# Annual IPv4 Transfers



As at 31 December

# Whois and Whowas

The screenshot shows the APNIC Whois Search interface. At the top, it says "APNIC Whois Search" and provides a link to the agency search form. Below that, it displays the search results for the IP address 203.133.248.0/24. The results are organized into two columns: "APNIC Whois" and "APNIC Whowas".

**APNIC Whois** results for 203.133.248.0/24:

- From Wed 08 Feb 2017 to the present
- network name: APNIC-AU-RD
- network: 203.133.248.0 - 203.133.251.255
- country: AU
- type: ALLOCATED PORTABLE
- remarks: /22 for APNIC R8D node in AU.
- description: APNIC R8D AU
- handle: IRT-APNICRANDET-AU
- name: IRT-APNICRANDET-AU
- kind: group
- address: PO Box 3646, South Brisbane, QLD 4101, Australia
- email: abuse@apnic.net

**APNIC Whowas** results for 203.133.248.0/24:

- From Mon 19 Sep 2016 to Wed 08 Feb 2017
- network name: APNIC-JP-RD
- network: 203.133.248.0 - 203.133.251.255
- country: JP
- type: ALLOCATED PORTABLE
- remarks: /22 for APNIC R8D node in JP.
- description: APNIC R8D Centre JP
- handle: IRT-APNICRANDET-AU
- name: IRT-APNICRANDET-AU
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- Whois uptime 99.997%
- 314 qps

- Upgrading whois to version 4
  - RDAP integrated into RIPEcodebase
  - Business rule validation scheduled for completion early 2017

[apnic.net/whois](http://apnic.net/whois)

- Whowas
  - Historical whois. At last!
  - API created to provide RDAP responses to historical queries
  - Enhanced user interface planning underway
  - Currently conducting integration testing

[apnic.net/whowas](http://apnic.net/whowas)

# blog.apnic.net

## Binding to an IPv6 subnet

By Joao Luis Silva Damas on 14 Sep 2016

Category: Tech matters

Tags: IPv4, IPv6, subnet

[Like](#) [Share](#) [21](#)  
[Tweet](#) [Pocket](#)

[Blog home](#)

The following was written by Joao Luis Silva Damas and Geoff H...  
In the original framework of the IP architecture, hosts had net...  
and network interfaces had single IP addresses. The list of act...  
interfases, and the manner in which they acquire IP addresses...  
configuration or by some dynamic mechanism via a query to a...  
specified in a boot-time configuration file.

For example, on a Debian Linux host system the configuration file /etc/network...  
enumerates the host's active network interfaces the same in which they are...  
address. One might see in that file some elements to configure the interface

```
iface eth0 inet static
address 198.51.198.2/24
gateway 198.51.198.1
```



## Women in ICT: Helping people communicate drives Indonesia's female network engineers

By Robbie Mitchell on 9 Sep 2016

Categories: Community, Development

Tags: capacity development, Indonesia, Women in ICT

[1](#) Comment

[Like](#) [Share](#) [212](#)  
[Tweet](#) [Pocket](#)



Earlier this year, the Association of Internet Service Providers in Indonesia (APJII) announced that internet penetration in Indonesia had now reached 40% of the population, or 100 million internet users – up from 88 million in 2014.

Such growth has, in turn, led to more jobs in the industry, opening the door for a new generation of engineers and operators to build the network for the future. Although Indonesia's three biggest telecommunication network and service providers – Telekomunikasi Indonesia (Telkom), XL Axiata and Indosat – control 85% of the market share, this growth has also opened the door to multiple smaller providers, and with it, an increase in job opportunities.

Views

Guest Posts

2016

198,715

80

70%

86%

2015

116,892

43

- Inclusive source of APNIC community news and views – 352 posts including 80 guest posts in 2016
- Strong readership growth continues – monthly average unique views 16,560 in 2016 (9,741 in 2015)
- Community submissions welcome!

# APNIC Foundation



[apnic.foundation](http://apnic.foundation)

- Officially incorporated in Hong Kong in September 2016
- First year of operation will be 2017

Partner & Project	Amount
IDRC for Seed Alliance	500,000 CAD
JICA for APNIC Academy	20,000 USD
ITU for IPv6 Training	9,500 USD
ITU for IXP Training	4,300 USD





# Next APNIC Conference

APNIC 44



TAICHUNG, TAIWAN  
7-14 September 2017

Registration available soon

[conference.apnic.net/44](http://conference.apnic.net/44)





# Coming later...



APRICOT 2018 / APNIC 45, Kathmandu, Nepal  
19 February to 1 March 2018



APNIC 46, Noumea, New Caledonia  
6 to 13 September 2018

**THANK YOU**

# APNIC's Vision

A global, open, stable and secure  
Internet that serves the entire Asia  
Pacific community

# APNIC Activities



Serving APNIC Members



Supporting Regional Internet  
Development



Cooperating with the Global  
Internet Community



# APNIC Activities



Serving APNIC Members



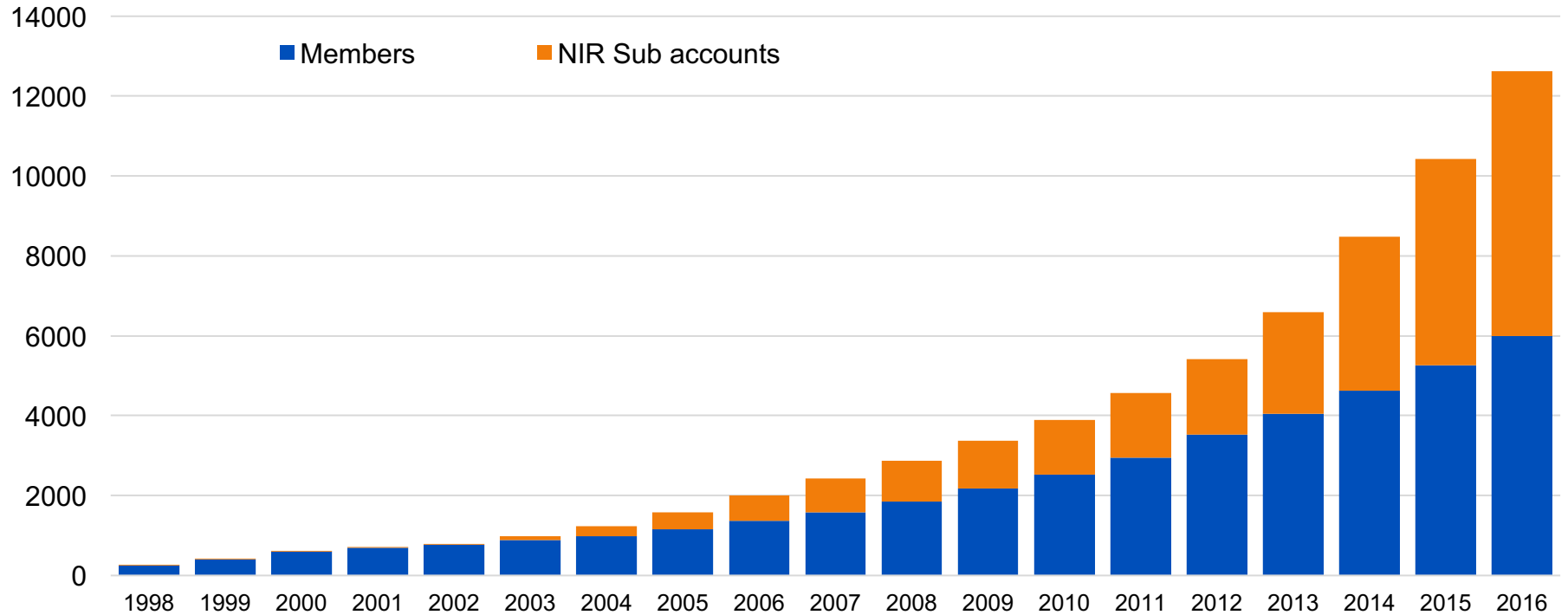
Supporting Regional Internet  
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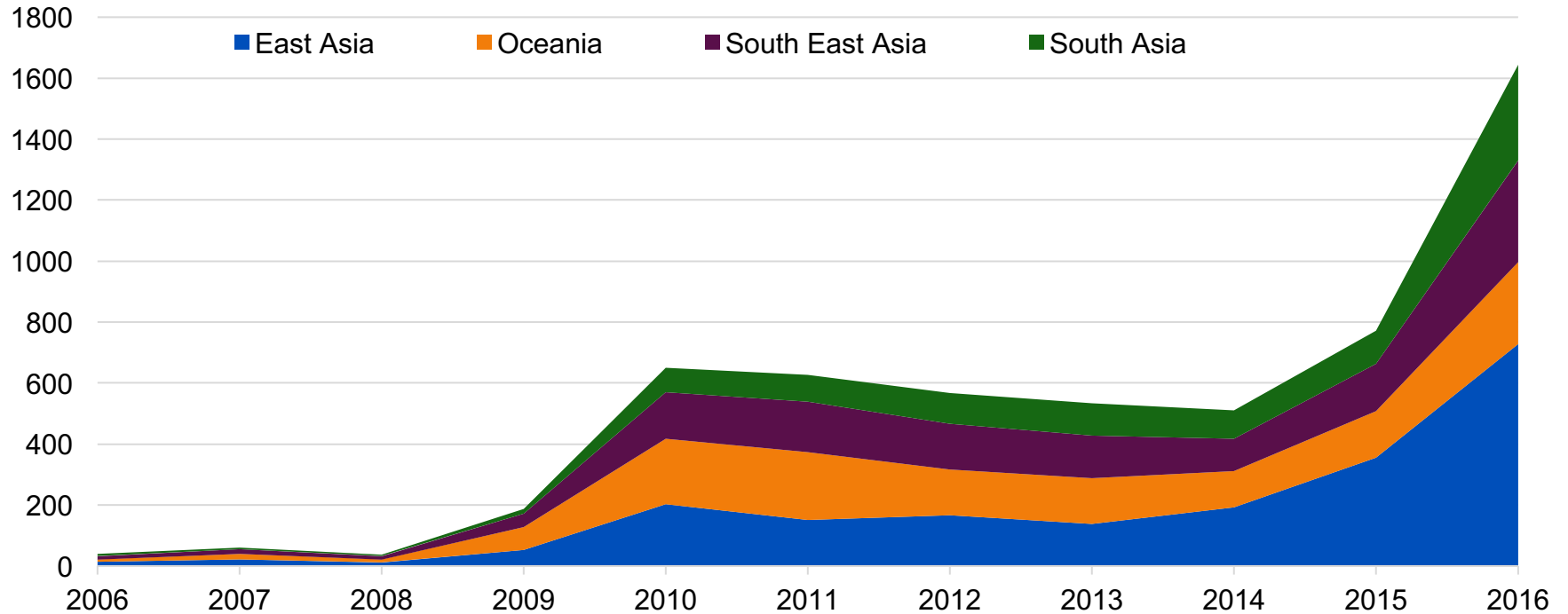
# APNIC and NIR Membership



As at 31 December



# Annual IPv6 Delegations

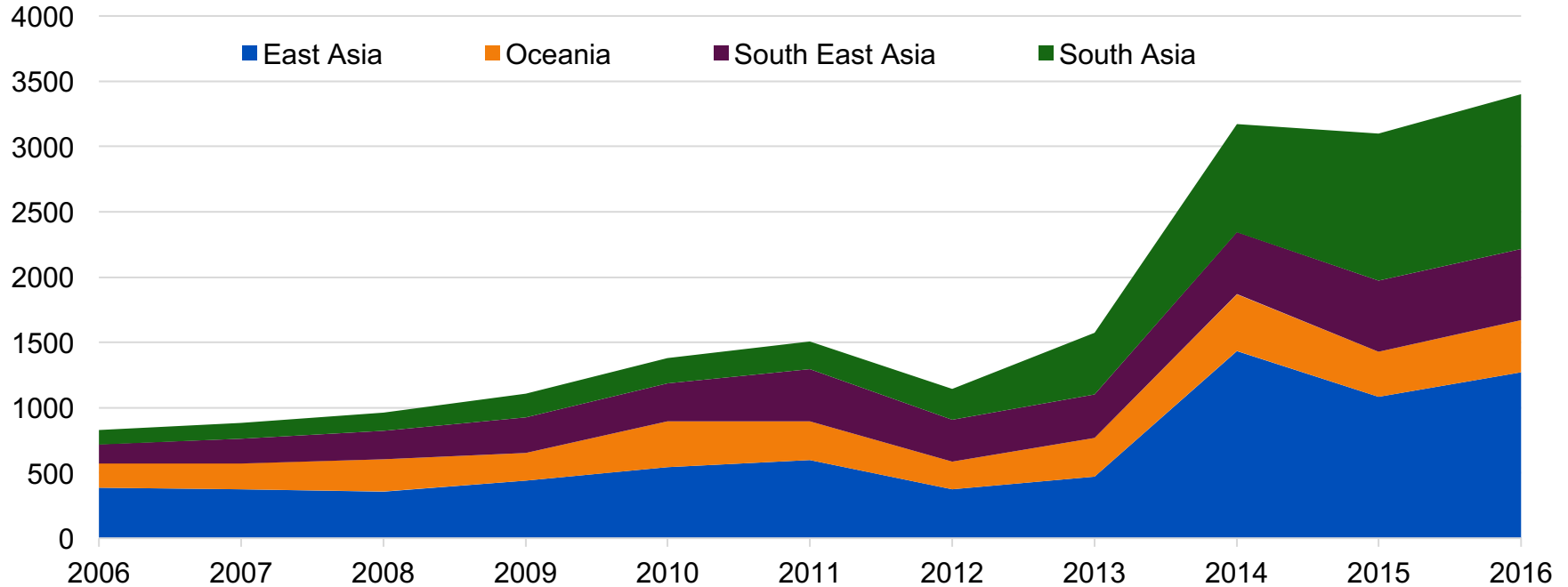


As at 31 December





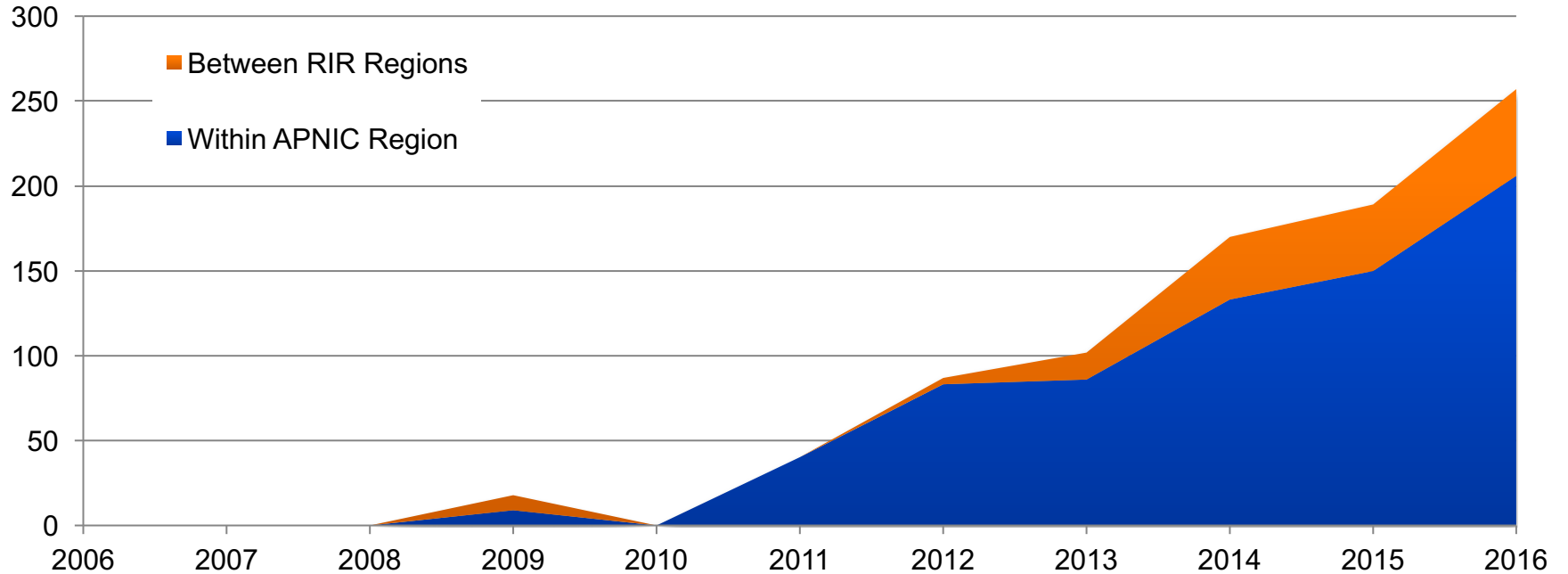
# Annual IPv4 Delegations



As at 31 December



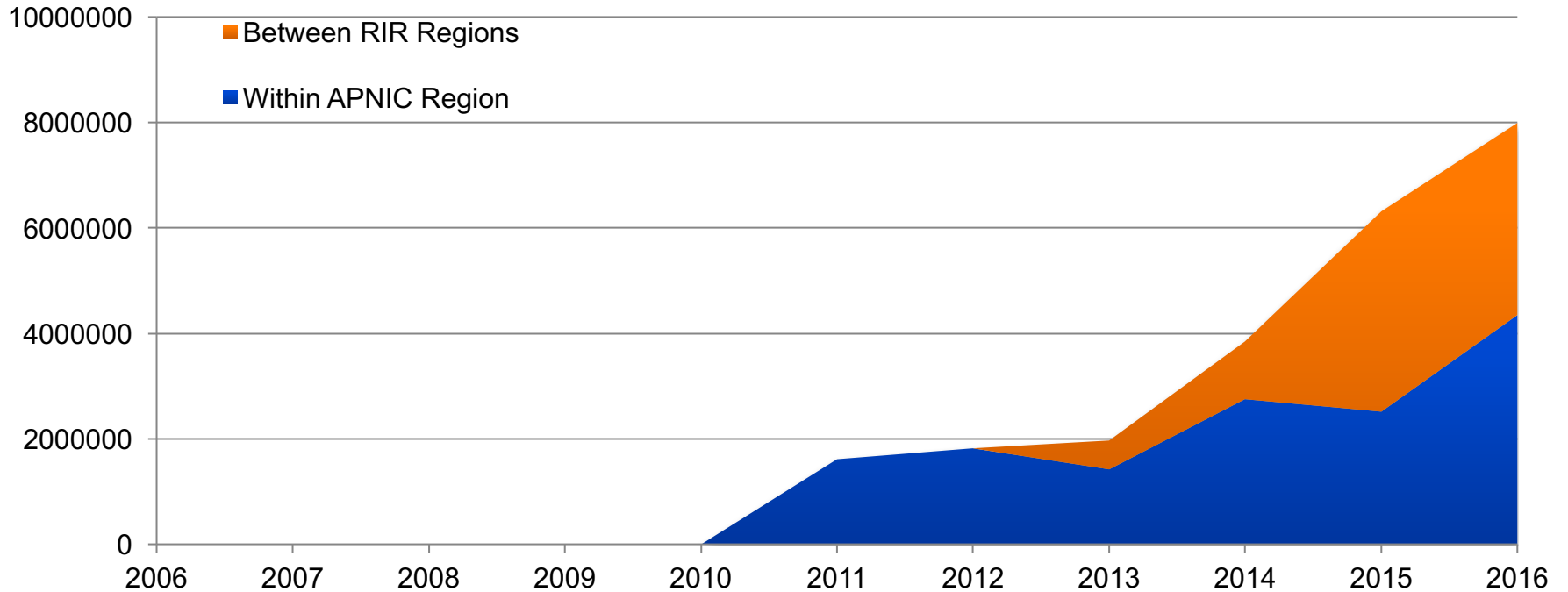
# Annual IPv4 Transfers



As at 31 December



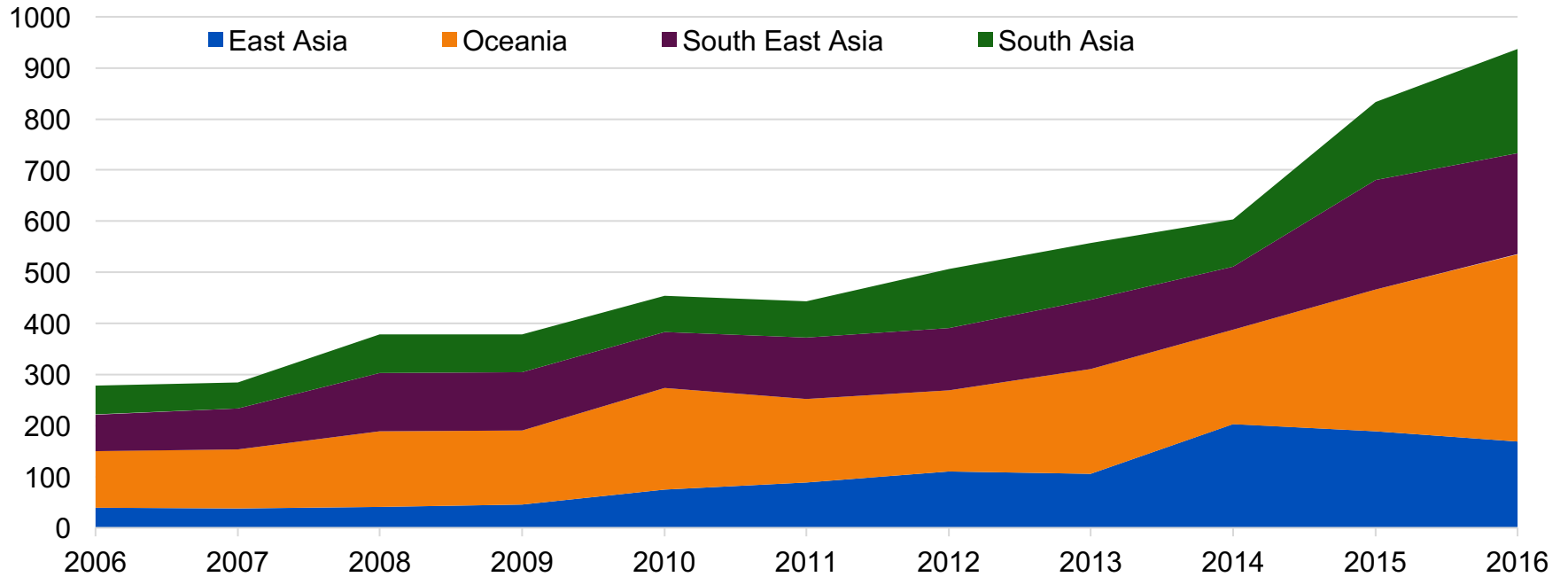
# Total IPv4 Addresses Transferred



As at 31 December



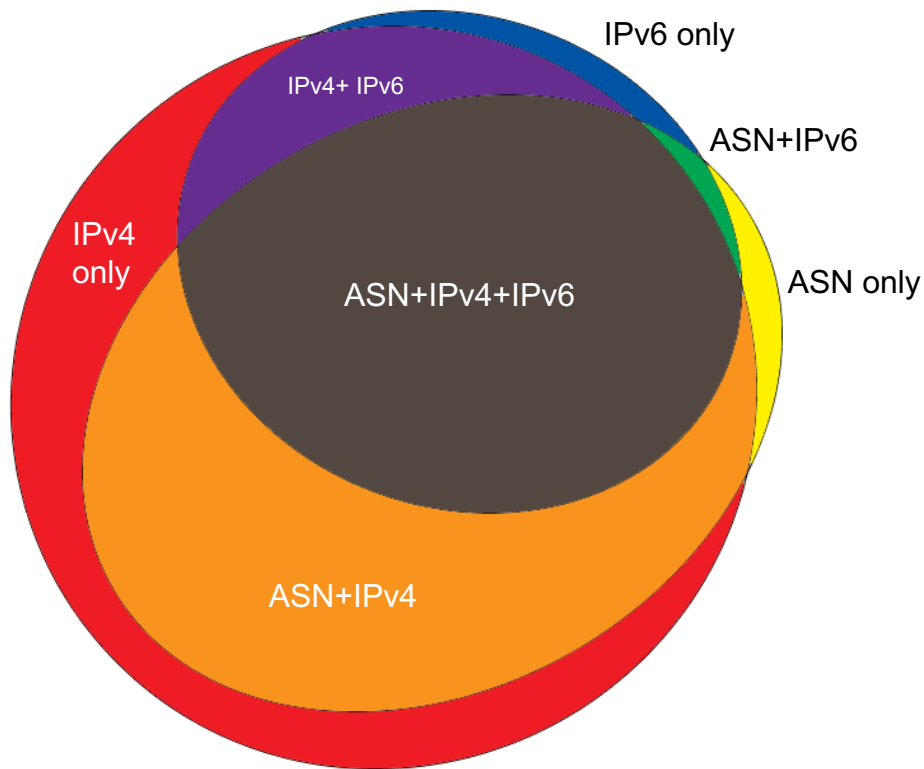
# Annual ASN Assignments



As at 31 December



# Member Resource Holdings



% of Members Holding	
ASN	74%
IPv4	96%
IPv6	51%



# Routing Security



“Ready to ROA” campaign  
Helping Members create ROAs  
7 sessions in 2016 (NP, NZ, BD, ID, IN, LK, MM)

Adoption rates steadily improving in Asia Pacific  
from 2.7% to 3.66% in 2016



- RPKI uptime 99.9995%
- 15 qps

## ROA stats (end 2016)

ROA-enabled Members	678
Numbers of ROAs created	492
Number of IPv4 addresses under ROAs (/32s)	7,916,800
Number of IPv6 addresses under ROAs (/56s)	2,450,610,432
% allocated space under ROAs (IPv4)	0.92%
% allocated space under ROAs (IPv6)	0.30%



# Whois Data Quality



- Community discussions at APNIC 41 and 42,
- Presentations by LEAs at APNIC 42
- 300 Members assisted to update whois contact details
- New “search and replace” tool to help Members keep multiple records current



# Online Services Updates

The image displays several screenshots of the APNIC website and its services. At the top left is the 'MyAPNIC' interface with a navigation menu (Home, Resources, Admin, Contact, Tools, Events, Voting, My Profile) and a 'Bulk Whois Attribute Updates' section. Below this is a 'Submit update request' form with fields for 'Whois type' (Public), 'Object type' (inetnum), and 'Object attribute' (mnt-irt). In the center is the main 'APNIC' website with navigation links (Get IP, Manage IP, Training, Events, Research, Community, Blog, About, Contact) and a user profile section showing 'Your IP address: 202.76.158.170'. Below the main site are four charts: 'IPv4 Total by Year' (line chart showing growth from 1999 to 2013), 'IPv4 by Subregion' (pie chart), 'IPv6/32 by Year' (line chart showing growth from 1999 to 2013), and 'IPv6 by Subregion (32)' (pie chart). To the right of the charts is a 'Homepage highlight' section for 'APRICOT 2017 APNIC 43' with a 'Message highlight' about online voting and proxy appointment.

## MyAPNIC Improvements

- Whois and billing functions
- Better authorization checks
- Integrated route and ROA management features
- Single view of IPv4 and IPv6 reverse DNS management

## [apnic.net](http://apnic.net)

- New CMS (Wordpress)
- Simplified design and navigation
- New resource delegation statistics portal

## [apnic.net/stats](http://apnic.net/stats)



- MyAPNIC uptime 99.998%
- 1,410 unique Members / month





# Whois and Whowas

**APNIC Whois Search**

To assist you with debugging problems, this whois query was received from IP Address: 209.40.4000.4786:8374:46:46:8

APNIC found the following authoritative answer from whois.apnic.net

APNIC WhoWas 203.133.248.0/24

From Wed 08 Feb 2017 to the present

- network name: APNIC-AU-RD
- network: 203.133.248.0 - 203.133.251.255
- country: AU
- type: ALLOCATED PORTABLE
- remarks: /22 for APNIC R8D node in AU.
- description: APNIC R8D AU
- handle: IRT-APNICRANDET-AU
- name: IRT-APNICRANDET-AU
- kind: group
- address: PO Box 3646, South Brisbane, QLD 4101, Australia
- email: abuse@apnic.net
- handle: AGL-AP
- name: APNIC Infrastructure Contact
- kind: group
- address: 6 Cordelia Street, South Brisbane, QLD 4101, Australia
- email: abuse@apnic.net

From Mon 19 Sep 2016 to Wed 08 Feb 2017

- network name: APNIC-JP-RD
- network: 203.133.248.0 - 203.133.251.255
- country: JP
- type: ALLOCATED PORTABLE
- remarks: /22 for APNIC R8D node in JP.
- description: APNIC R8D Centre JP
- handle: IRT-APNICRANDET-AU
- name: Jordan Tay
- kind: individual
- address: 6 Cordelia Street, South Brisbane, QLD 4101, Australia
- voice: +12 2456 7890
- email: jordan@apnic.net
- handle: IRT-APNICRANDET-AU
- name: APNIC Infrastructure Contact
- kind: group
- address: PO Box 3646, South Brisbane, QLD 4101, Australia
- email: abuse@apnic.net

- Upgrading whois to version 4
  - RDAP integrated into RIPEcodebase
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[apnic.net/whowas](http://apnic.net/whowas)



- Whois uptime 99.997%
- 314 qps



# Technical Projects

Projects underway in 2016 for completion in 2017

Project	2016 Progress
Registry System Development	<ul style="list-style-type: none"><li>• System separated into front-end clients and registry back-end</li><li>• Legacy code replaced with completely rewritten code</li></ul>
CRM System	<ul style="list-style-type: none"><li>• Mailing list component implemented</li><li>• Data modelling and workflow process under development</li></ul>
Whois Version Update	<ul style="list-style-type: none"><li>• Query-side changes were completed in 2016 with a query node running the new code deployed</li></ul>
ISO27001 Adoption	<ul style="list-style-type: none"><li>• Independent external cybersecurity audit conducted</li><li>• Documented required policies, procedures and practices to address gap analysis</li></ul>
Data backup and retention management	<ul style="list-style-type: none"><li>• Bareos backup system chosen and archival server installed</li></ul>



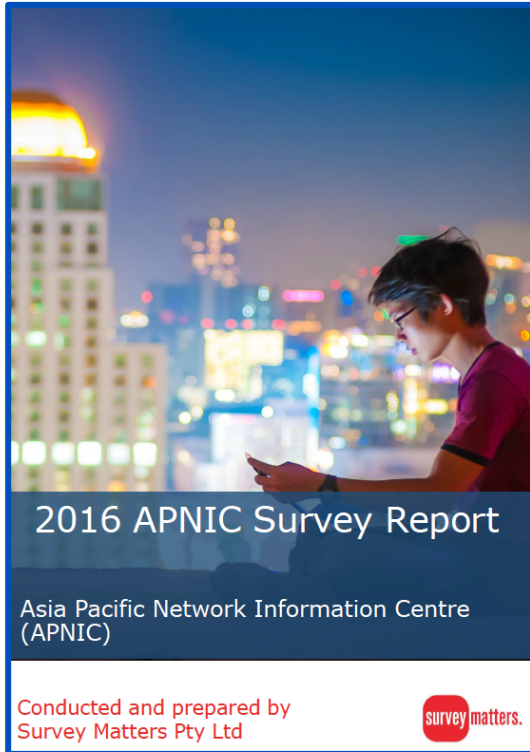
# Quality Management



- Full ISO9001 recertification audit
- Updated Quality System to AS/NZS ISO9001/2016
- Includes knowledge management and risk management
- Passed!



# APNIC Survey 2016



- Thank you for your participation!
- Survey completed with 1,175 valid responses from 62 economies
- Full report and EC response available for review: [apnic.net/survey](http://apnic.net/survey)
- Activity plan and survey response activity tracker live: [apnic.net/survey-response-activity/](http://apnic.net/survey-response-activity/)

# APNIC Activities



Serving APNIC Members



Supporting Regional Internet  
Development



Cooperating with the Global  
Internet Community



# Policy Update

- APNIC 41
  - prop-115: Registration of detailed assignment information in whois DB abandoned
    - Instead presented as informational presentation to gauge community interest
  - Secretariat introduced travel support program for SIG Chairs and Co-Chairs
- APNIC 42
  - prop-116: Prohibit to transfer IPv4 addresses in Final /8 block did not reach consensus and was returned to author
  - "A proposal to review the procedures for electing APNIC SIG Chair and Co-Chair positions" did not reach consensus and was returned to author





# Policy Update

- APNIC 43

Policies that did not reach consensus and returned to the mailing list

- prop-116: Prohibit to transfer IPv4 addresses in the final /8 block
- Prop-118: No need policy in APNIC region

Reached partial consensus:

- prop-117 - Returned IPv4 address management and Final /8 exhaustion
- The part of the proposal that reached consensus:
  - Recovered 103/8 space will be placed in the 103/8 (Final /8) pool
  - Recovered non-103/8 space will be placed in the IPv4 Recovered pool
- SIG Elections: Sumon Ahmed Sabir (Chair), Ching-Heng Ku and Bertrand Cherrier (Co-Chairs)



# Training and Technical Assistance



[training.apnic.net](http://training.apnic.net)

	2016
Face-to-face training	62
Locations	25
Trainees	1,934
Community Trainers	9
Courses	12
Locations	6
eLearning sessions	130
Trainees	883
Training YouTube videos	108
Views	132,532
Technical Assistance	9 members (ID, FJ, NC, BD, TL)

Updated IRM, IRR, Network Security, MPLS, SDN, NFV courses with new hands-on exercises



# Community Outreach



BKNIX 1



IXP workshop, Timor L'este

- Supported 13 NOG and IX events with presentations, hostmaster consultations, tech support and sponsorship
- IXP workshop and technical assistance provided in Timor L'este, resulting in test case IXP
- J-root instance in APNIC's co-location facility
- 3 RIPE Atlas Anchors deployed: BT, KH and PG (+4 underway NP, MM, IN, MN); 112+ Atlas probes
- MoU signed with Sri Lanka CERT|CC and renewed MoU with APIA

# Security Outreach



- Security training and participation at 27 NOG and CERT events
- LEA conferences in Malaysia and Korea; continued engagement with Interpol
- Training and support for creation of new Tonga CERT; exploring viability of CERT in Vanuatu
- FIRST Tech Colloquia with APRICOT 2016, SANOG 28, APNIC 42
- Paul Wilson joined GFCE Advisory Board
- 62 security-tagged blog posts published

[apnic.net/security](https://apnic.net/security)

# IPv6 Outreach



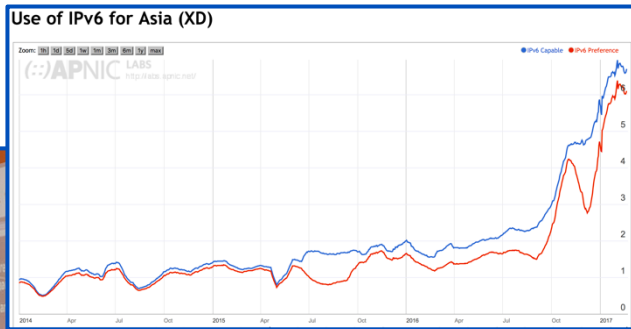
[apnic.net/IPv6](http://apnic.net/IPv6)

- 18 face-to-face training sessions, 501 trainees including IPv6 workshop with ITU in TH
- 36 elearning sessions reaching 245 trainees
- Promoting IPv6 with presentations at 23 regional events
- Input to policy makers to include IPv6 in UN ESCAP's AP-IS plan
- Assisted Singapore IDA's IPv6 survey and ASEAN workshop
- Supported IGF IPv6 Best Practices Forum



# APNIC Labs

Research to help the APNIC community make informed technical decisions



[labs.apnic.net](http://labs.apnic.net)

- Over 7 million measurements per day, measuring IPv6, DNSSEC, DNS
- Data for DNS Root Zone key roll and ICANN's Universal Acceptance (IDN) program
- Measurement and testing support to operators planning IPv6 deployment
- Presentations at 18 forums including IETF, RIRs, ICANN, DNS OARC, NOGs, OECD
- Geoff Huston continues on ICANN SSAC, and contributing to ICANN GAC Public Safety Working Group

# APNIC Conferences



	APRICOT 2016	APNIC 42	APRICOT 2017
Delegates	531	332	654
Economies represented	53	39	56
APNIC Members represented	125	133	178
Remote sessions viewed	1,238	1,545	1,595
Fellows	22	52	41
Women	6	20	13
Youth		14	

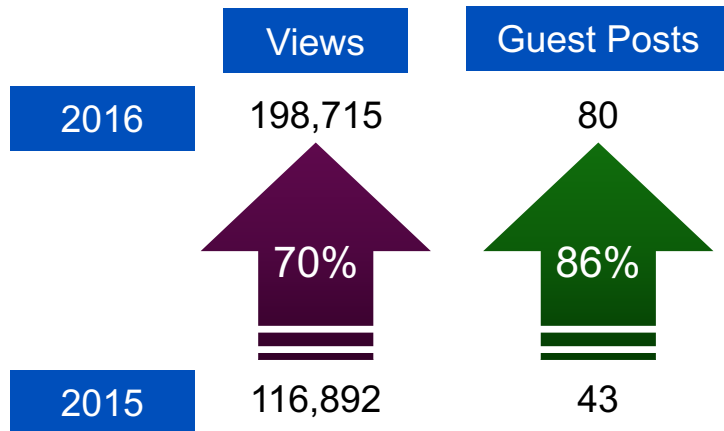
[conference.apnic.net](http://conference.apnic.net)

APNIC 2016



**Binding to an IPv6 subnet**  
By Joao Luis Silva Damas on 14 Sep 2016  
Category: Tech matters  
Tags: IPv4, IPv6, subnet

**Women in ICT: Helping people communicate drives Indonesia's female network engineers**  
By Robbie Mitchell on 9 Sep 2016  
Categories: Community, Development  
Tags: capacity development, Indonesia, Women in ICT



- Inclusive source of APNIC community news and views – 352 posts including 80 guest posts in 2016
- Strong readership growth continues – monthly average unique views 16,560 in 2016 (9,741 in 2015)
- Community submissions welcome!

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ITU for IPv6 Training	9,500 USD
ITU for IXP Training	4,300 USD



[isif.asia](http://isif.asia)

- 300+ applications for 2016 Grants
  - APNIC Internet Operations Research Grant
  - ISOC Cybersecurity Grant
  - Community Impact Grant
  - Technical Innovation Grant
- 10 projects selected from nine economies
- AUD 431k in project funding from supporters ISOC, IDRC-CRDI, APNIC
- Mentoring program commenced for projects from India and Myanmar
- Two projects received support to attend the 2016 awards ceremony



# APNIC Activities



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Development



Cooperating with the Global  
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# Global Cooperation



- With ICANN on APT preparatory process for ITU-WTSA
- With ISOC, ICANN and LACNIC on ITU-WTSA conference
- With LACNIC on IPv6 at APEC-TEL 53
- With FIRST to host Tech Colloquia at four AP events
- With ISOC, ICANN and RIPE on IPv6 panel at UNCTAD eCommerce Week
- With NRO and ITAC for IPv6 session at OECD Ministerial Meeting
- At 3<sup>rd</sup> World Internet Conference – Paul Wilson a member of High-Level Advisory Council

# IANA Stewardship Transition



- Plan approved by USG and stewardship of functions transferred to global community on 30 September 2016
- SLA for IANA Numbering Services signed at ICANN 56 by RIRs and ICANN
- APNIC EC passed a resolution at APNIC 42 thanking the APNIC community for their support of the process

*“This is a celebration of the process as much as it is of the results. This process has – once again – demonstrated that the multistakeholder model works, and is the best governance model to maintain a growing, stable and open Internet.*

*No single person, company, organization, or government runs the Internet; it belongs to everyone.”*

Excerpt from Colombo Statement



# RIR Collaboration



AFRINIC 24



Sandra Bras, RIPE NCC

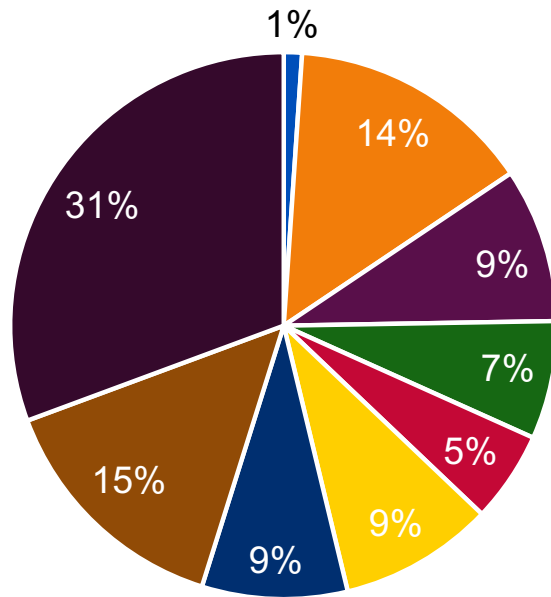


RIPE 72

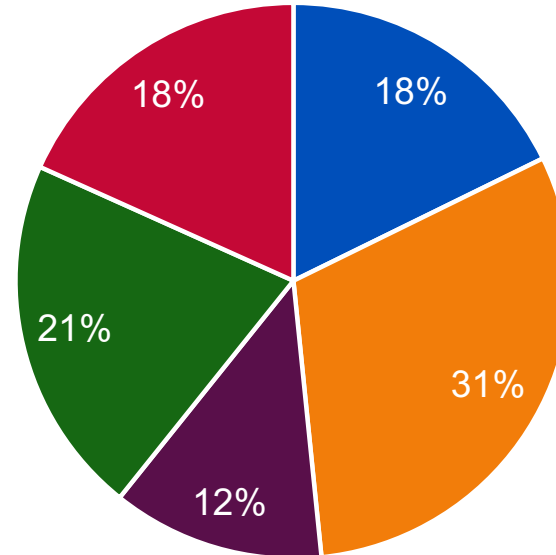
- APNIC RDAP code incorporated into RIPE WHOIS version 4 + RDAP history extension proposal
- APNIC Academy development with RIPE NCC
- Communications support for AFRINIC 24
- RIR staff visits to APNIC from LACNIC, AFRINIC, RIPE NCC
- Joint APNIC EC-RIPE NCC Board meeting at RIPE 72
- Active NRO CG participation – engineering, registry, comms, finance, HR
- Worked with LACNIC to present IPv6 deployment update at APEC TEL 53 in Peru
- Participation at eight RIR meetings



# Engagement Summary



- APNIC Events
- Global Technical Coordination
- Regional Technical Development
- Intergovernmental
- Internet Governance
- Member Outreach
- NOG
- Security
- Training / Technical Assistance



- South Asia
- South East Asia
- East Asia
- Oceania
- Global

186 Engagements in 2016

# Behind the scenes...

- 1,947 invoices processed, 888 journals prepared, 3,377 credit card transactions settled
- Added 3D Secure functionality to credit card payment portal
- Insurance provider and coverage reviewed
- 10 roles recruited – 695 applicants
- Staff Conference to reinforce 2016-2019 Strategic Plan





# Next APNIC Conference

APNIC 44



TAICHUNG, TAIWAN  
7-14 September 2017

Registration available soon

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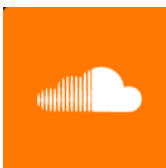
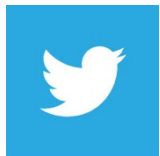


APNIC 46, Noumea, New Caledonia  
6 to 13 September 2018





# Stay in Touch!



[blog.apnic.net](http://blog.apnic.net)

[apnic.net/social](http://apnic.net/social)

# THANK YOU