Topics of Discussion

- ARIN 101
- Getting your own resources
  - AS numbers, IPv4, IPv6
- IPv4 Waiting List
- IPv4 Transfer Market
- IPv6 Addressing Plans
- Important ARIN Services

ARIN
American Registry for Internet Numbers

ARIN 101

- Established in 1997 as a nonstock corporation in Virginia, USA

- **Nonprofit** – 100% community funded, fee for services, not number resources

- **Membership Organization** – open, broad-based from private & public sectors and civil society

- **Community Regulated** – Open and transparent, policies developed by community, member-elected executive board

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Mission Statement

ARIN, a nonprofit, member-based organization, supports the operation of the Internet through the **management of Internet number resources** throughout its service region; **coordinates the development of policies by the community** for the management of Internet Protocol number resources; and **advances the Internet through informational outreach.**

ARIN Service Region

Region includes Canada, 25+ Caribbean and North Atlantic economies, & the United States and minor outlying areas

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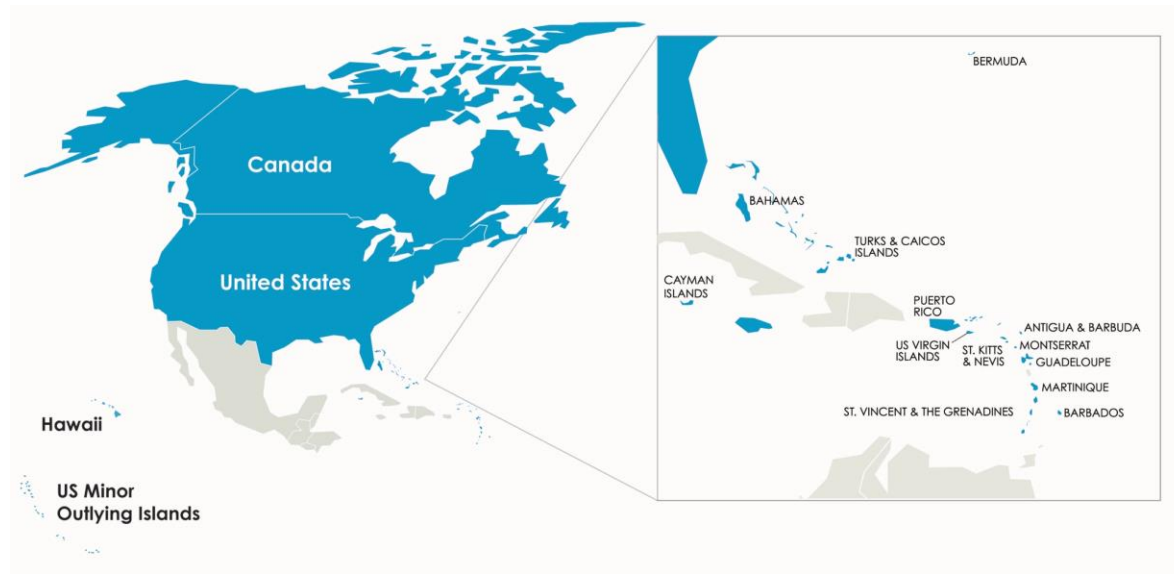
ARIN's Canadian Representation

- 3 members of ARIN's Board of Trustees
  - Paul Andersen, Chair
  - Bill Sandiford, Vice Chair
  - Nancy Carter, Treasurer
- 2 members of ARIN's Advisory Council
  - Alyssa Moore
  - Chris Tacit
- 1 member of the NRO NC
  - Kevin Blumberg

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Representation Matters!

- Some problems are uniquely Canadian
  - Third-Party Internet Access (TPIA) is a big example
  - Canadian representatives & members created policies to solve that problem
- If you have a uniquely Canadian problem, reach out & ask for help!

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What does ARIN do?

- Distributes IP addresses and autonomous system numbers (ASNs) to ensure global uniqueness

- Provides reverse DNS and operates directory services which allow the public to determine to whom the IP addresses and AS numbers are registered

- Supports Internet infrastructure through technical coordination

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You can come to ARIN for…

- IP address allocations & assignments
- ASN assignments
- Transfers
- Reverse DNS
- Record Maintenance
- Directory services – Whois, Whowas…

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ARIN Services

- ARIN Online (customer web portal)
- Security (DNSSEC, RPKI)
- Directory-related: Whois, Whois RWS, RDAP
- Community Software Project Repository
- Operation Test & Evaluation (OT&E) Environment

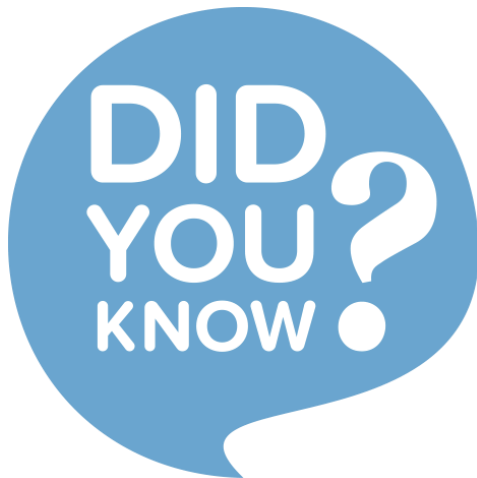# Getting Resources from ARIN

Get an AS Number (optional) → **Get IPv6** → **Get Reserved IPv4 Space** → **Go On IPv4 Waiting List** → **Explore IPv4 Transfer Market**

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Getting an ASN Number

| Submit request via ARIN Online | → | Provide one of the following:

• 2+ ISPs you'll be using
• Unique routing policy | → | $550 initial registration fee |

DID YOU KNOW?
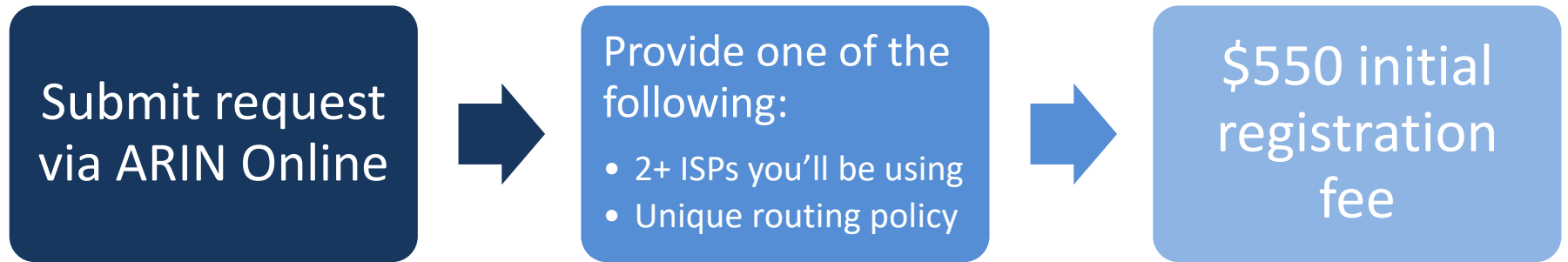
You can get IPv4 & IPv6 addresses from ARIN without an AS Number

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Requesting IPv6 - ISPs

Have a previous IPv4 allocation from ARIN or predecessor registry

OR

Provide a plan which details at least 50 assignments made within 5 years

OR

Intend to IPv6 multi-home

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IPv6 ISP Block Size

/48 typically assigned to customers
- Might be smaller, e.g. /56, for residential

/32 default generally sufficient
- Enough to number 65k+ customers
- May request /36 to keep fees low

Larger blocks based on:
- # of serving sites (PoPs, datacenters)
- # of customers at largest serving site
- Block size to be assigned

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Reserved IPv4 for IPv6 Deployment

/10 reserved under policy in April 2009

- 357 /24s issued to date (97.8% remains available)

Must be used to facilitate IPv6 deployment

- Dual stacking key servers, NAT-PT/NAT464, etc.

Must have an IPv6 block

One per organization every six months

- /24 maximum size

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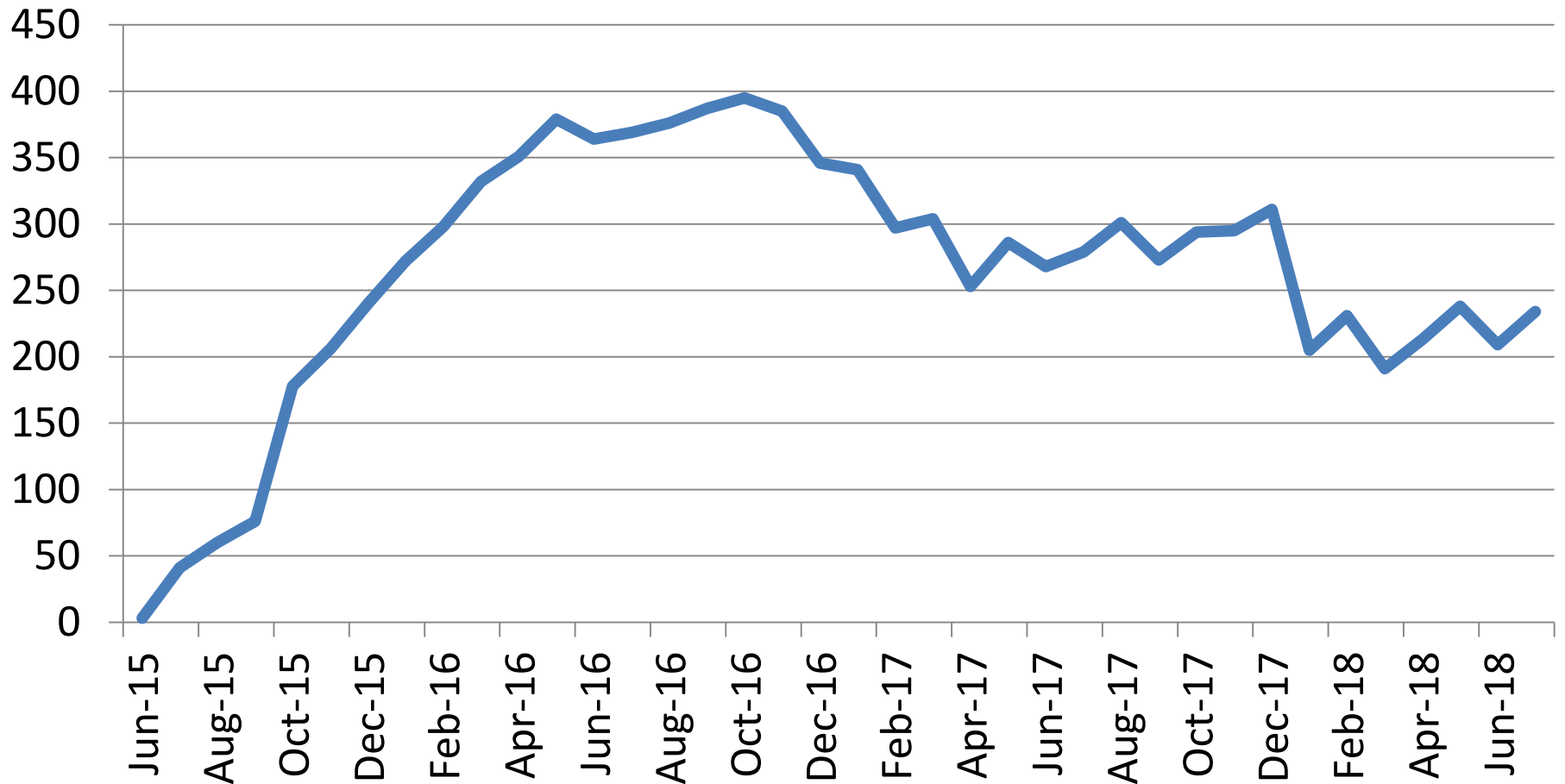# IPv4 Waiting List

Requesters have the waiting list option

- Initial /21 (ISP) or /24 (EU) with no justification
- Larger blocks based on 24 month need
- Requester may specify a smaller acceptable size
- One request per org on the list at a time

Oldest requests filled first

Requests met by transfer are removed

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IPv4 Waiting List Growth

Waiting List Statistics

635 (55%) have been filled

- Last request filled waited ~9 months

275 (24%) dropped off

- Most got IPv4 via the transfer market

Of the 1,147 requests added:

237 (21%) still waiting

- Oldest added 23 Aug 2017

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IPv4 Transfer Policies

Mergers and Acquisitions (NRPM 8.2)

- Traditional transfer resulting from a merger, acquisition, or reorganization supported by legal documentation

Transfers to Specified Recipients (NRPM 8.3)

- IPv4 market transfer from one organization to another that it specifies, supported by justified need (within region)

Inter-RIR transfers to Specified Recipients (NRPM 8.4)

- IPv4 market transfer from one organization to another that it specifies, supported by justified need (between regions)

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Transfer Pre-Approval

Optional <u>free</u> service to confirm your 24 month projected IPv4 need

Receive IPv4 addresses via multiple need-based transfers up to the pre-approved amount over the next 24 months

$300 fee to complete each transfer

Now paid at the time transfer is submitted

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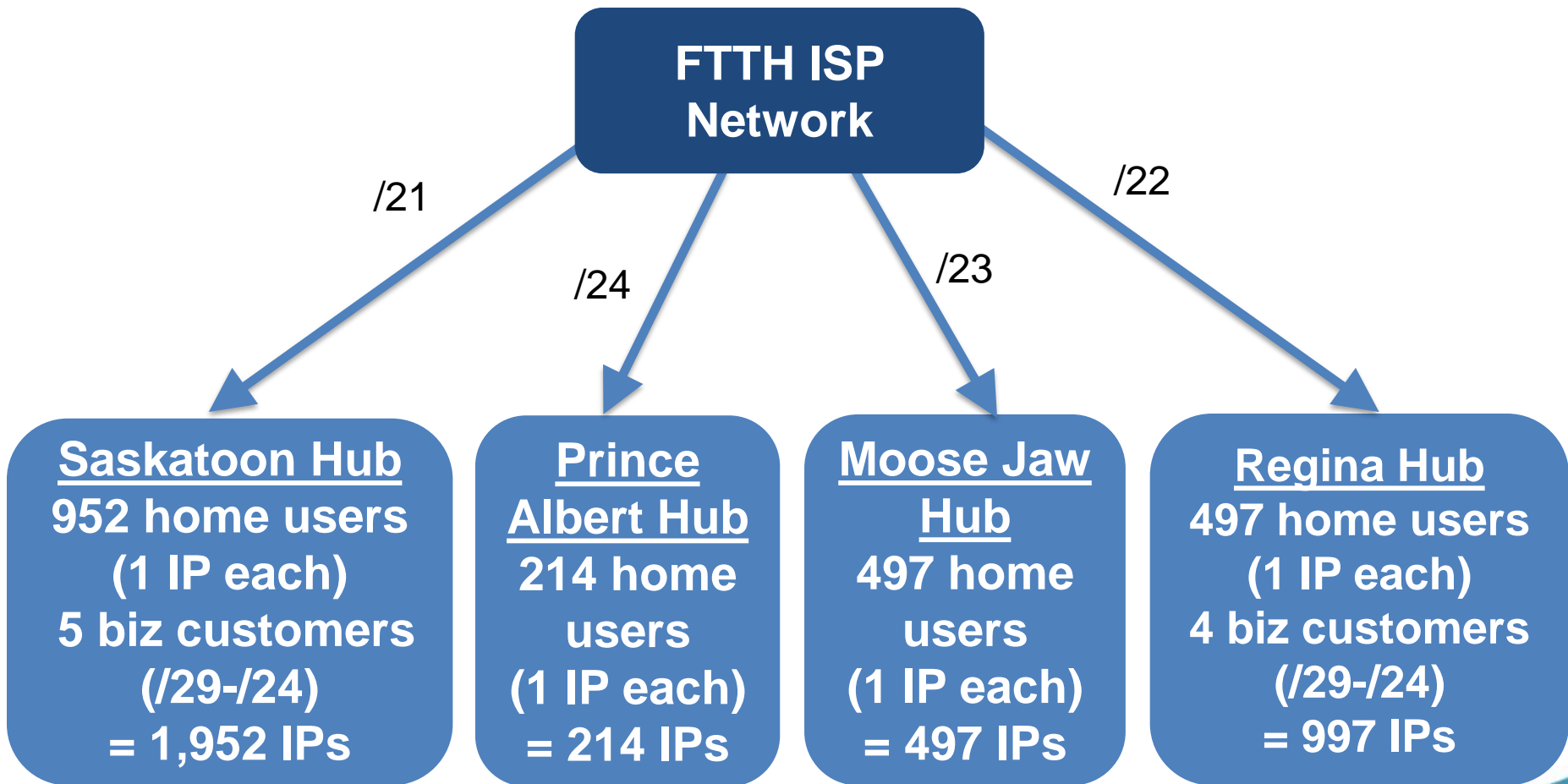American Registry for Internet Numbers

Subnetting: IPv4 vs IPv6

- The IPv4 mindset: think in terms of IP addresses
  - "If a site has 50 devices, I give it a /26"
- The IPv6 mindset <u>does not work</u> for IPv6
  - Last 64 bits used for device autoconfiguration
  - …and we have a ton of IPv6 addresses
- The correct IPv6 mindset: <u>think in terms of subnets, not addresses</u>
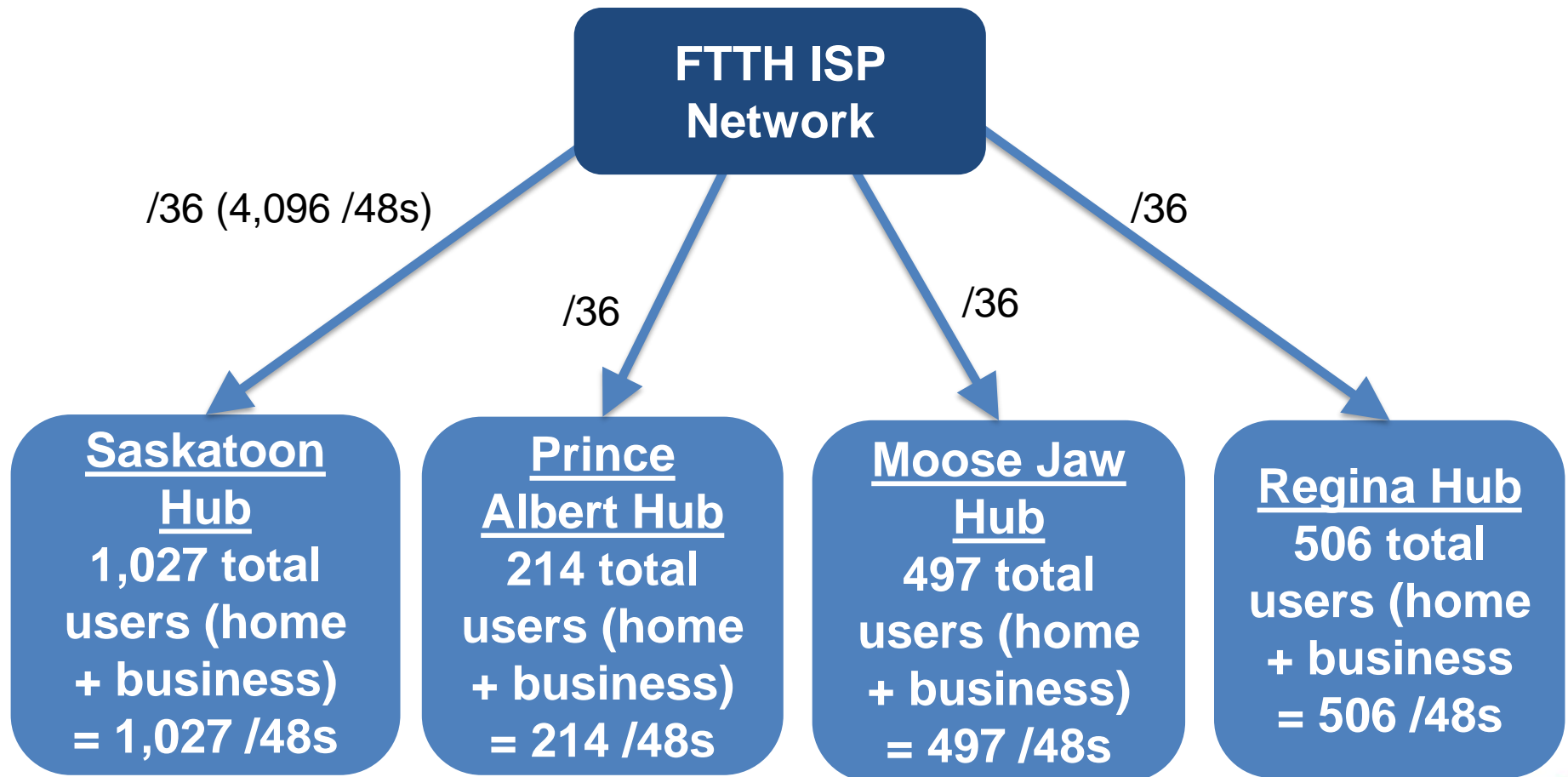
IPv6 Subnetting – NANOG BCOP

- Each individual network segment gets a /64
  - A /64 can hold a near-infinite number of devices
- Subnet on nibble boundaries for DNS
  - /48, /44, /40, etc.
- Addressing plans should be hierarchical, with each level using subnets of the same size
  - Each site gets a /48
  - Customers generally get a /48
  - PoPs/aggregation points sized based on largest

IPv4 Address Plan: ISP

```
                    ┌─────────────┐
                    │  FTTH ISP   │
                    │   Network   │
                    └─────────────┘
        /21      /24          /23       /22
```

Saskatoon Hub
952 home users
(1 IP each)
5 biz customers
(/29-/24)
= 1,952 IPs

Prince Albert Hub
214 home users
(1 IP each)
= 214 IPs

Moose Jaw Hub
497 home users
(1 IP each)
= 497 IPs

Regina Hub
497 home users
(1 IP each)
4 biz customers
(/29-/24)
= 997 IPs

IPv6 Address Plan: ISP

FTTH ISP Network

/36 (4,096 /48s)

/36

/36

/36

Saskatoon Hub
1,027 total users (home + business) = 1,027 /48s

Prince Albert Hub
214 total users (home + business) = 214 /48s

Moose Jaw Hub
497 total users (home + business) = 497 /48s

Regina Hub
506 total users (home + business = 506 /48s

Anatomy of an IPv6 Address

2001:0DB8:3007:000A:B9D3:284A:83E2:90DB

/32 from ARIN

Hub /36
0 = Saskatoon
1 = Pr. Albert
2 = Moose Jaw
3 = Regina
4 = Future Hub
... etc

Site /48
001 = Regina Site 1
002 = Regina Site 2
....
007 = Regina Site 7

Subnet /64
0001 = Subnet 1
0002 = Subnet 2
....
000A = Subnet 10

Device /128
Autoconfigured
with MAC
Address
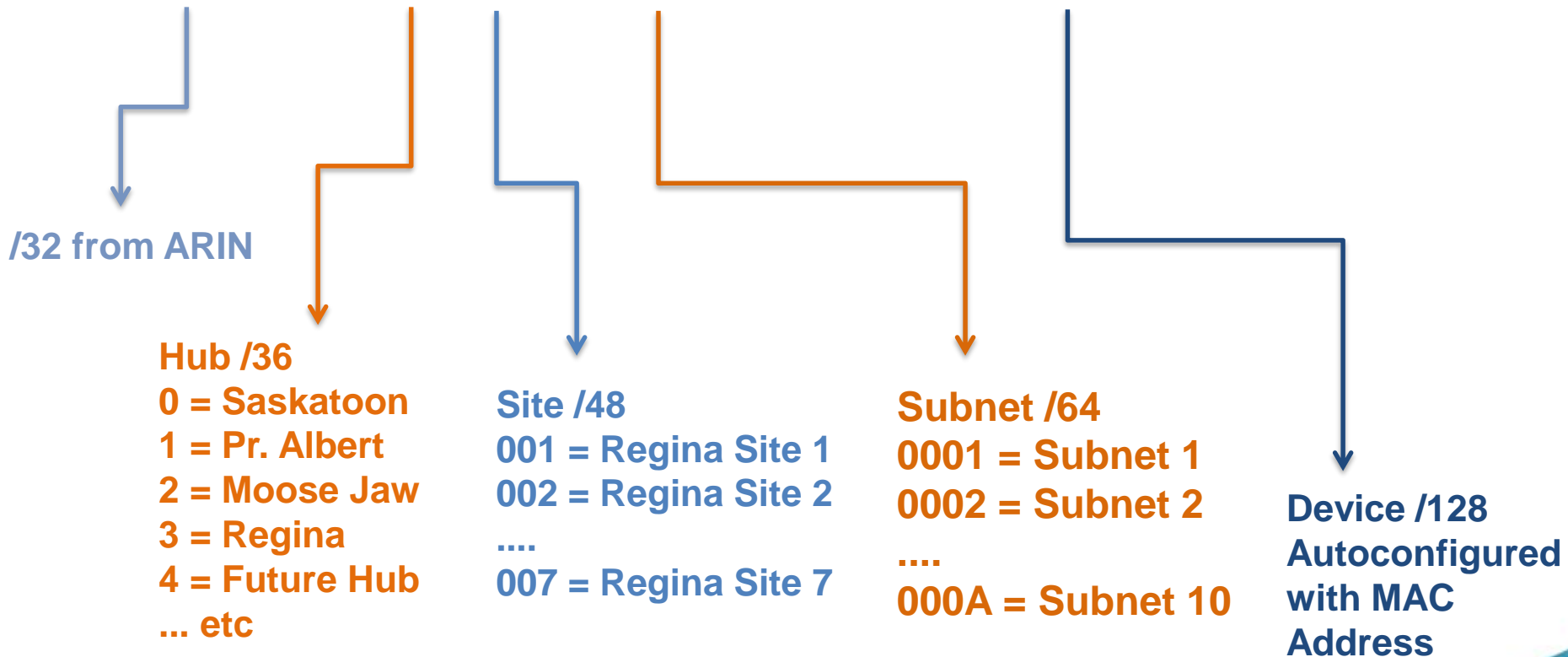
ARIN IS HERE TO HELP

Visit our Help Desk onsite at CANWISP to find out what every WISP needs to know about ARIN.

Our Registration Services team can help you request IP addresses, update Whois, and so much more.

Or call the ARIN Help Desk any time between 7:00 AM - 7:00 PM ET Monday - Friday at 703.227.0660.

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www.arin.net

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Visit the ARIN Help Desk onsite

- How do I submit a request for resources or transfer?

- Can you review a ticket I've submitted?

- Can I get IPv4 address space to help with my IPv6 deployment?

- Could you walk me through how to update my ARIN Whois records?

- How do I validate my Point of Contact record?

- Am I eligible to get IPv6 with no additional fees?

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Key Takeaways for WISPs

- Get resources directly from ARIN
  - It's quick & easy
  - We are here to help
- Visit the on-site help desk
- Call our help desk for assistance

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Questions?