

# Resource Certification (RPKI)

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Minority Address Space



# Address Space Managed by the RIPE NCC

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- /8 blocks allocated by IANA
- A vast amount of small blocks out of a /8 that is managed by one of the other four RIRs.
  - So called “minority” address space
- This isn’t related to inter-RIR transfers, but part of the legacy InterNIC days...

# For Example, 128/8 is Managed by ARIN

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- But the RIPE NCC manages and allocates from:
  - 128.0.0.0/16, 128.7.0.0/16, 128.16.0.0/16,  
128.39.0.0-128.41.255.255, 128.45.0.0/16,  
128.65.0.0-128.79.255.255, 128.86.0.0/15,  
128.93.0.0/16, 128.98.0.0/16, 128.124.0.0/16,  
128.127.0.0/16, 128.130.0.0/15,  
128.139.0.0-128.142.255.255, 128.176.0.0/16,  
128.178.0.0/15, 128.199.0.0/16, 128.204.0.0/16,  
128.214.0.0/16, 128.232.0.0/16, 128.234.0.0/16,  
128.240.0.0/16, 128.243.0.0/16, 128.246.0.0/16

# Making Minority Space Eligible for RPKI

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- We built a framework that allows us to cross-sign these resources:
  - We put the minority space for each RIR on separate certificates
  - This allows the corresponding RIR to sign them with their root certificate, attesting that our data is accurate

# What Does This Mean For You?

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- LIRs who hold prefixes out of minority space, will now see them on their certificate, if they are:
  - IPv4 Provider Aggregated
  - IPv4 Allocated Unspecified
  - IPv4 PI marked as INFRA
  - IPv4 Anycast marked as INFRA
  - IPv6 Aggregated by RIR
  - IPv6 PI marked as INFRA
  - IPv6 Anycast marked as INFRA

# All ranges are eligible now, but not all types!

- Not yet eligible for certification:
- Address space held by non members
  - Policy proposal 2013-04: Resource Certification for non-RIPE NCC Members
- Legacy address space:
  - Policy proposal 2012-07: RIPE NCC Services to Legacy Internet Resource Holders

# Quick Update

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# RPKI Validator Has a RESTful API

- <http://server:port/api/v1/validity/AS12654/93.175.147.0/24>

```
▼ {
  ▼ "validated_route": {
    ▼ "route": {
      "origin_asn": "AS12654",
      "prefix": "93.175.147.0/24"
    },
    ▼ "validity": {
      "state": "Invalid",
      "reason": "as",
      "description": "At least one VRP Covers the Route Prefix, but no VRP ASN matches the route origin ASN",
      ▼ "VRPs": {
        ▼ "matched": [],
        ▼ "unmatched_as": [
          ▼ {
            "asn": "AS196615",
            "prefix": "93.175.147.0/24",
            "max_length": 24
          }
        ],
        ▼ "unmatched_length": []
      }
    }
  }
}
```



# SURFnet RPKI Dashboard: rpki.surfnet.nl

Home Global Top 10 IPv4/6 Per AS RIR Stats RPKI routes World map Trends Alexa Top500

## RPKI Dashboard

Select a RIR below to view the corresponding charts:

### Breakdown per RIR

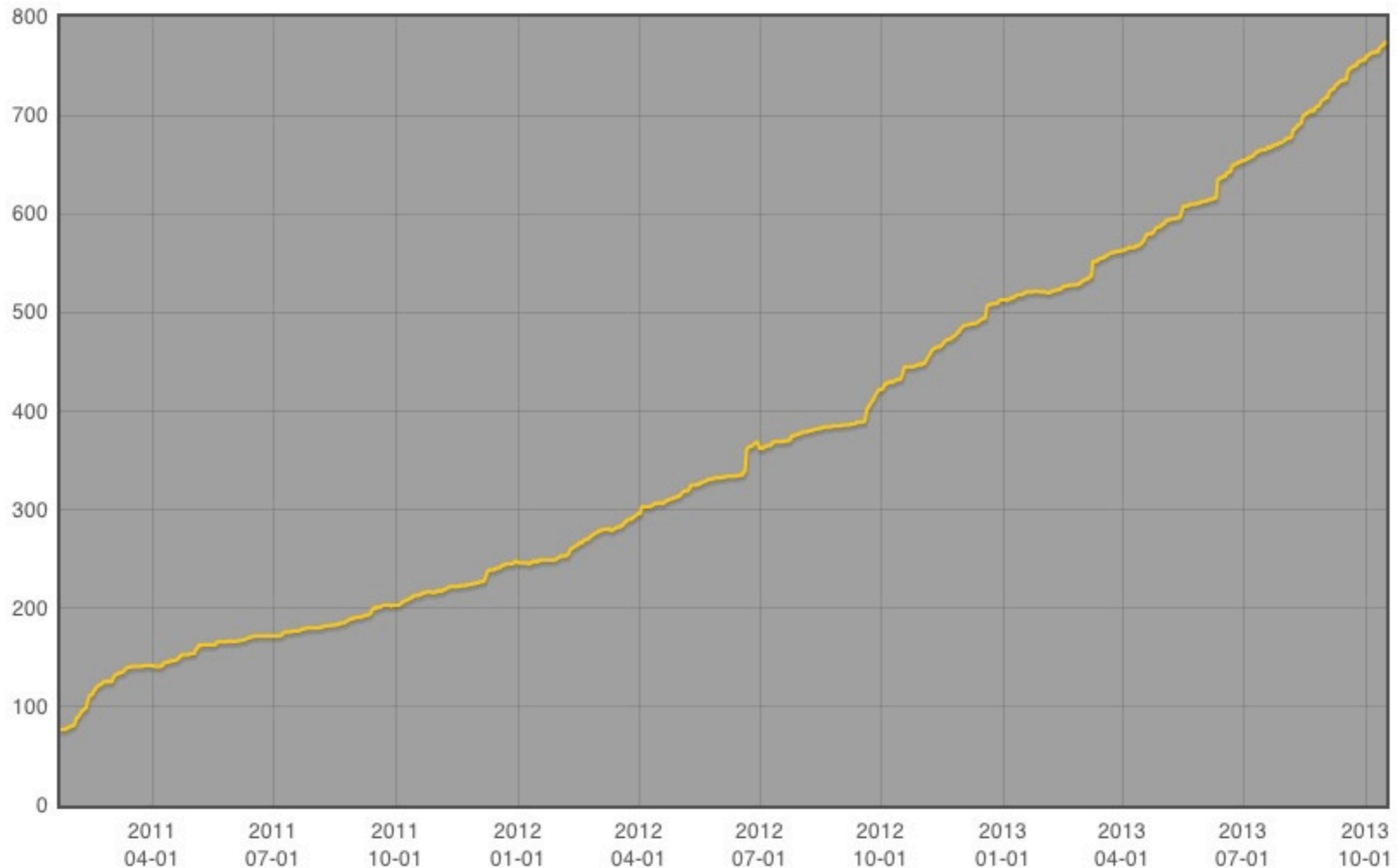
10 records per page

Search:

RIR	Total	Valid	Invalid	Unknown	Accuracy	RPKI Adoption Rate
AFRINIC	11428 (100%)	40 (0.35%)	48 (0.42%)	11340 (99.23%)	45.45%	0.77%
APNIC	118075 (100%)	118 (0.1%)	234 (0.2%)	117723 (99.7%)	33.52%	0.3%
ARIN	186394 (100%)	610 (0.33%)	50 (0.03%)	185734 (99.65%)	92.42%	0.35%
LACNIC	60147 (100%)	10872 (18.08%)	1100 (1.83%)	48175 (80.1%)	90.81%	19.9%
RIPE NCC	131601 (100%)	7274 (5.53%)	1137 (0.86%)	123190 (93.61%)	86.48%	6.39%

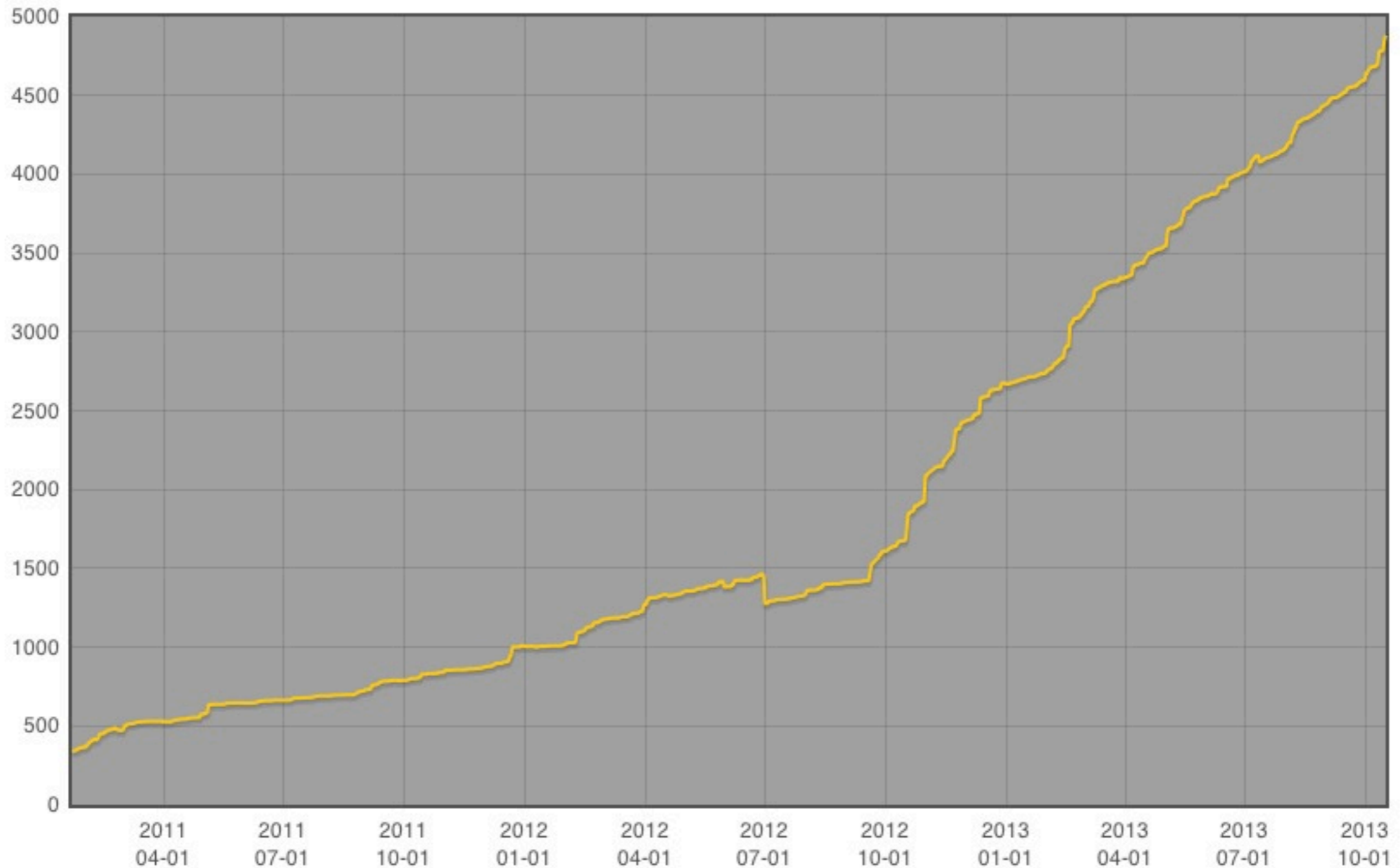
# Stats: Number of Signed IPv6 Prefixes

Almost 800 prefixes covered by a ROA



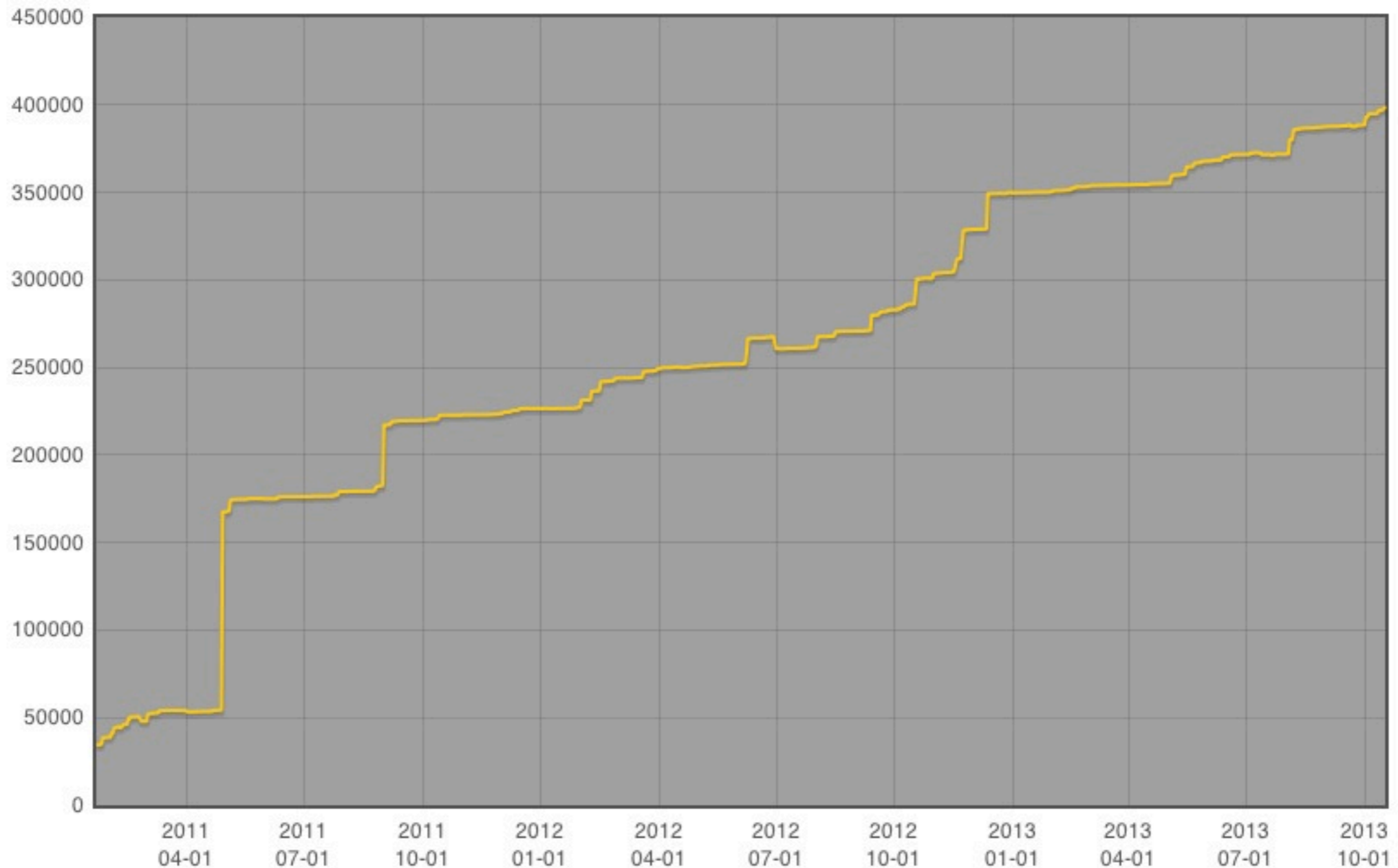
# Stats: Number of Signed IPv4 Prefixes

Almost 5,000 prefixes covered by a ROA



# Stats: Amount of Signed IPv4 Address Space

400,000 /24s = six /8 blocks



# Questions?

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