

Allocation & Announcement

How Long before Prefixes are Used?

APNIC / Ha Noi

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Randy Bush <randy@psg.com>

ARIN Engineering

<<http://rip.psg.com/~randy/050908.apnic-alloc.pdf>>

Some Questions

- How much delay is there from when an RIR allocates IP space until it is announced in BGP?
- Related Questions:
 - Difference between allocations from RIR and from LIRs
 - Who is announcing, *expected AS*?

Data Sources

- Allocation data from ARIN processed by ARIN
 - To be easy to parse
 - Remove administrative oddities (non-payment suspensions, etc.)
- BGP data from Route Views RIB dumps from 1997 to present

ARIN Data

```
net_handle (needed to differentiate same-sized networks)
start_ip
end_ip
org_id
org_name
start_date (may be null; format is YYYY-MM-DD HH:MM:SS)
end_date
date_last_updated
type
```

```
NETfoo|3.0.0.0|3.255.255.255|OrgID|OrgName|1988-02-23 \
00:00:00||2002-09-26 14:08:54|DS
```

where type is one of four values:

DA - direct allocation

DS - direct assignment

A - reallocation; able to be further subdelegated

S - reassignment; no further subdelegation is permitted

Route Views Data

```
147.28.0.0 16 3130 2000-02-08 09:40:00 2000-02-08 09:40:00
  prefix len orig first-appears last-appears
```

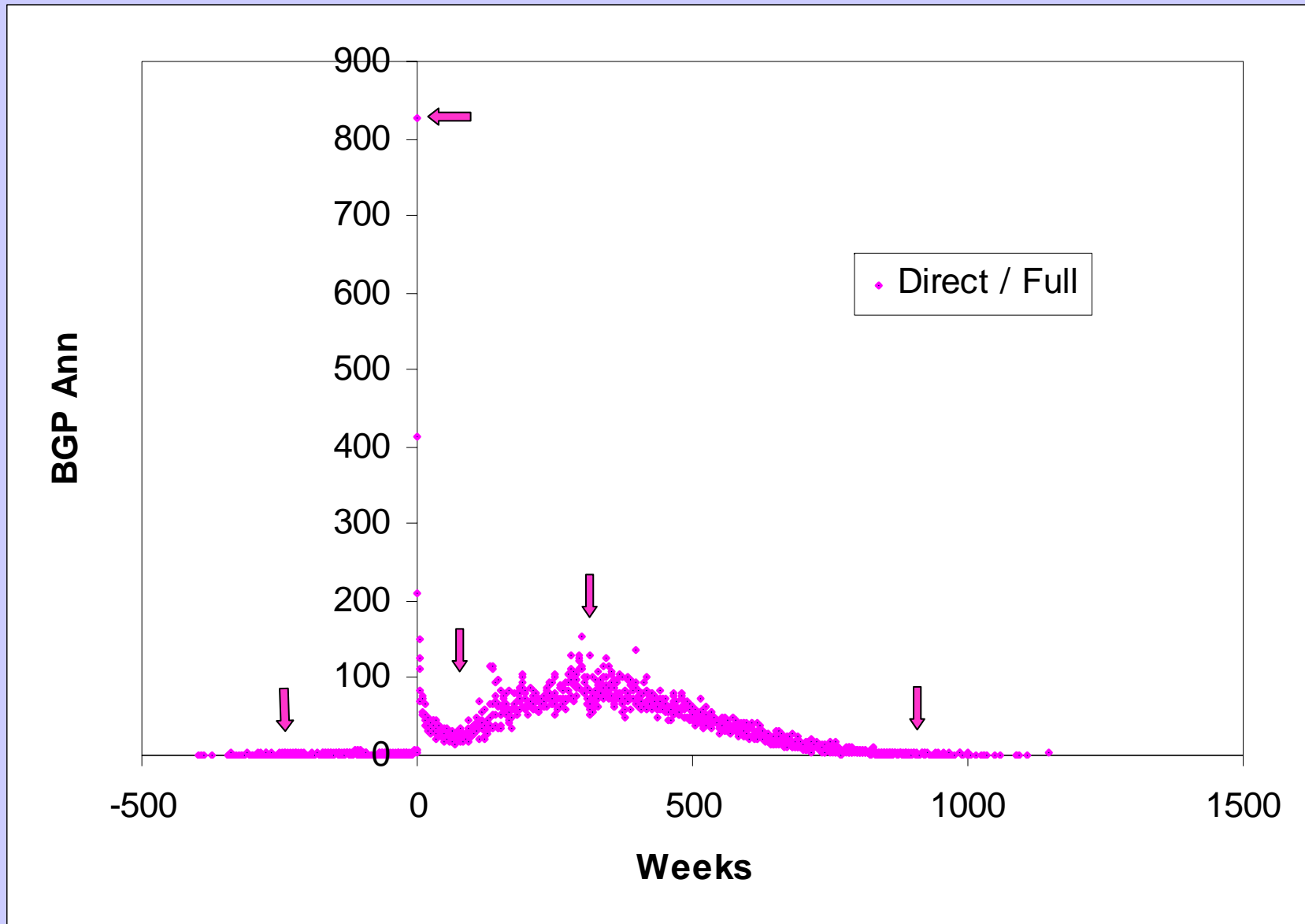
From RIB data

```
* i3.0.0.0 144.232.9.61 4 100 0 1239 701 703 80 i
*> 129.250.11.41 37 0 2914 701 703 80 i
* 199.238.113.9 37 0 2914 701 703 80 i
* i4.0.0.0 144.232.9.61 4 100 0 1239 3356 i
*> 199.238.113.9 37 0 2914 3356 i
* 129.250.11.41 37 0 2914 3356 i
```

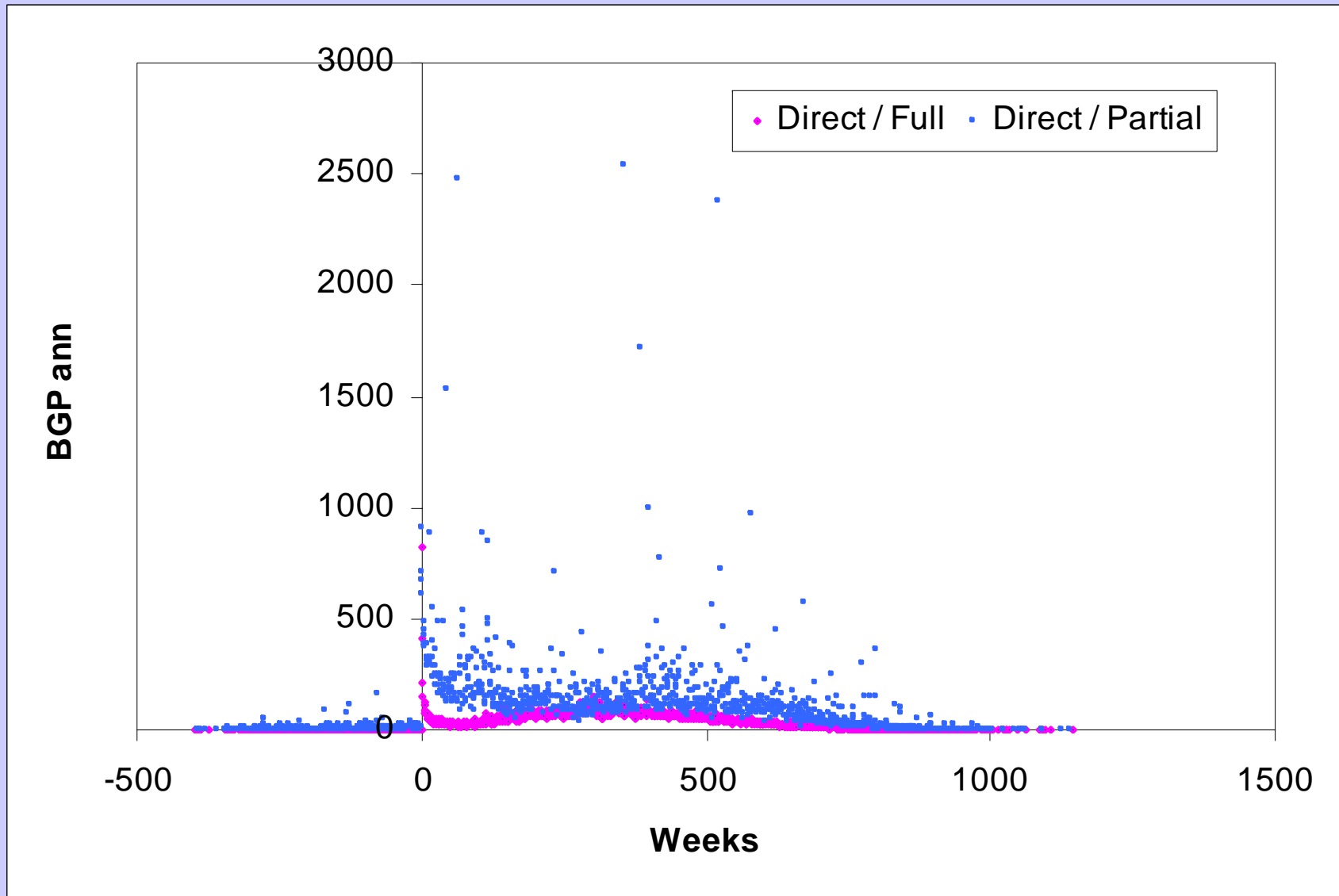
Analysis

- Route Views data run at University of Oregon Route Views complex
- ARIN extraction run at ARIN database complex
- Combined and processed on my laptop
- Analysis done in Python, I needed to learn a new language
- Python ROCKS!

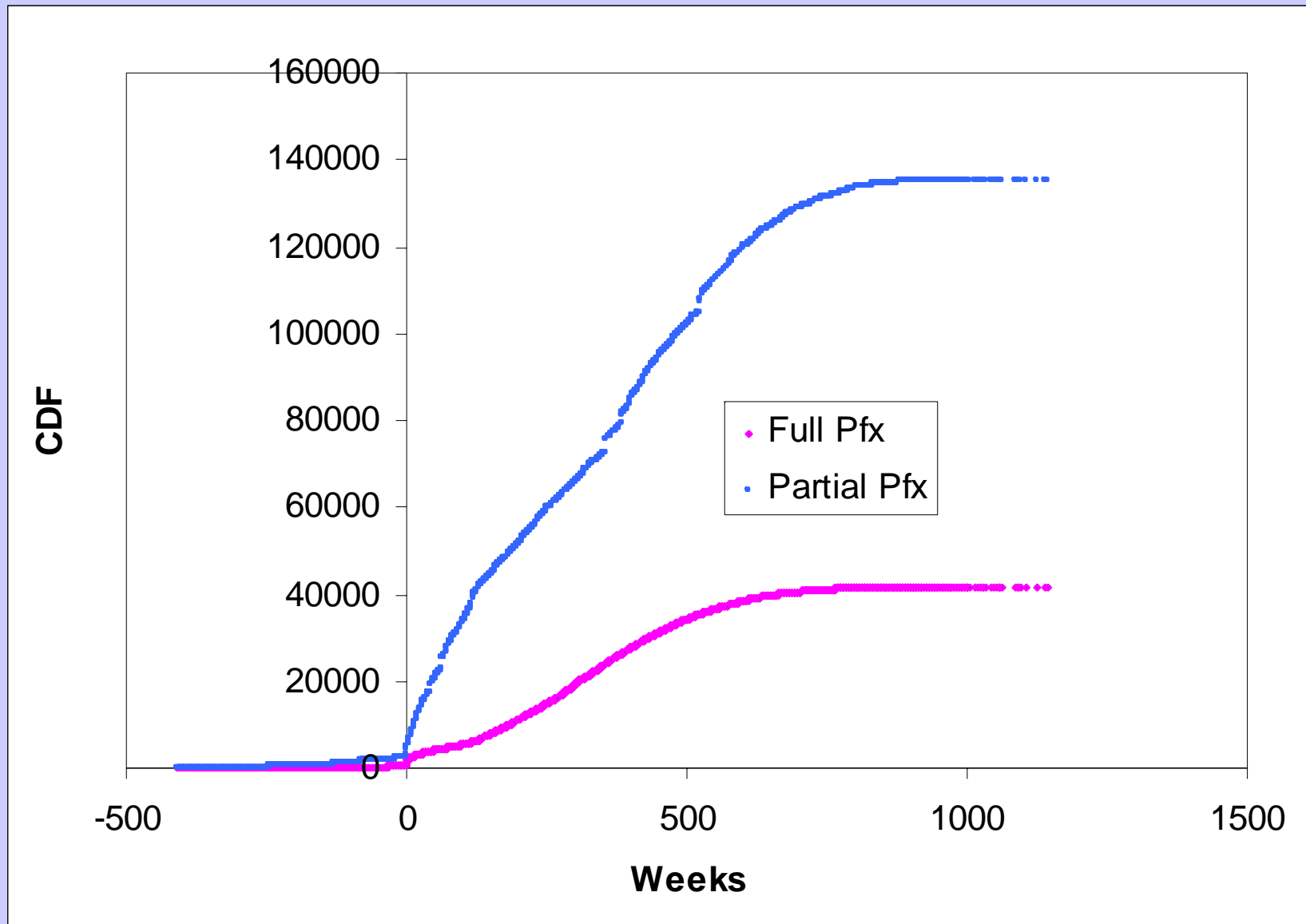
Time from Assign to Announce



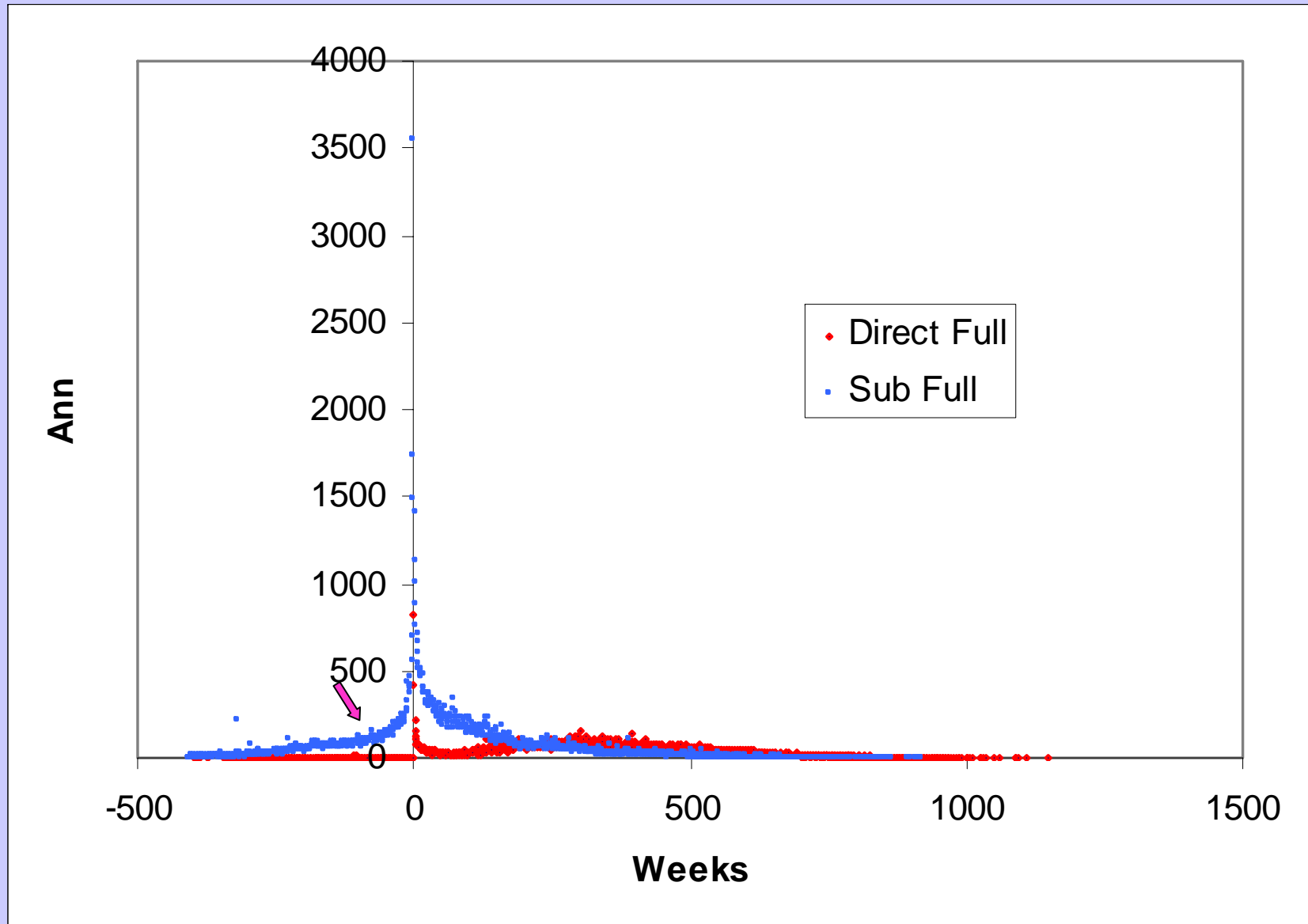
Full & Partial Prefix



CDF in Time



Direct vs Sub-Allocs



Thoughts

- Some tend to announce pretty quickly once they get an allocation
- Some don't register sub-allocs until they need more space from ARIN
- More study needed!

Thanks To

- ARIN for data and support
- NSF via award ANI-0221435 (Oregon)
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- Verio and Sprint (bandwidth)
- Juniper, Cisco, & Procket (routers)