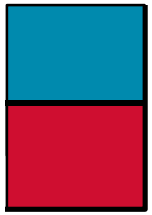


Asia Pacific Region Routing Table Analysis

Philip Smith **pfs@cisco.com**

IEPG 46 - 7 Nov 1999

- **Aim**
  - **Investigate regional trends in routing table**
  - **Look specifically at Asia Pacific region**

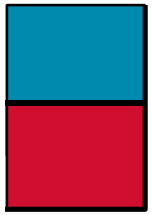
Asia Pacific Region Routing Table Analysis

- routing table taken from APNIC router view at NSPIXP2 in Japan
- “warts and all” - no filtering applied
- daily summary taken at 4am AEST (+10 GMT)
- results on APNIC web page

  www.apnic.net/stats/bgp

- mailing list

  bgp-stats@lists.apnic.net



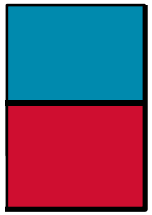
Asia Pacific Region Routing Table Analysis

- **Software**

  C programme which takes current routing table and analyses it

  APNIC address and AS ranges programmed in to produce APNIC region specific routing summary

  Address/ASN assignments prior to APNIC existence not included



Asia Pacific Region Routing Table Analysis

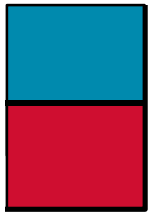
- **Output**
  - **e-mail posts summary of processing**
  - **data files record full routing table, and breakdown**
  - **webpage summarises “interesting statistics”**

E-mail output - summary

```
Asia Pacific Report   02 Nov, 1999

BGP routing table entries examined                              66472
    Prefixes being announced by APNIC ASes                       6473
    Prefixes being announced from the APNIC address blocks       8299
Origin ASes present in the Internet Routing Table                5929
    APNIC origin ASes present in the Internet Routing Table       564
Origin ASes announcing only one prefix                           1826
    APNIC origin ASes announcing only one prefix                  176
Transit ASes present in the Internet Routing Table                921
    APNIC transit ASes present in the Internet Routing Table       80
Illegal AS announcements present in the Routing Table               4
Number of addresses announced to Internet                  1108114656
    Equivalent to 66 /8s, 12 /16s and 124 /24s
    Percentage of available address space announced              29.6
    Percentage of allocated address space announced              48.6
    Percentage of available address space allocated              61.0
Number of APNIC addresses announced to Internet              38215617
    Equivalent to 2 /8s, 71 /16s and 31 /24s
    Percentage of available APNIC address space announced        45.0

    APNIC ASes              4608 - 4864, 7467 - 7722, 9261 - 10239
    APNIC Address Blocks    61/8, 202/7 and 210/7
```



Some Definitions

- **Origin AS**

  AS listed at end of the AS-PATH

- **Transit AS**

  AS next to Origin AS in AS-PATH

- **“Illegal” AS**

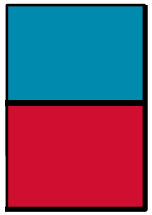
  ASNs > 64511

- **“available” address space**

  everything except draft-manning-dsua-01.txt

- **“allocated” address space**

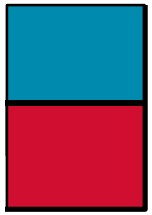
  everything from “available” which isn’t “IANA reserved”



AP routing table

APNIC per AS prefix count summary

ASN	No of nets	/19 equiv	Description
4740	392	82	Ozemail
7657	270	12	The Internet Group Limited
4755	165	61	Videsh Sanchar Nigam Ltd. Ind
7545	157	6	TPG Internet Pty Ltd
9269	148	11	Hong Kong CTI
4618	142	46	Internet Thailand
7714	123	57	NETLINK-NZ-AS-AP
7496	117	4	Power Up
4786	109	6	NetConnect Communications Pty
4766	96	210	KORnet Powered BY Korea Telec
7474	90	42	Optus Communication
4713	84	291	NTT-OCNET
7586	76	8	Paradox Digital Pty
4763	75	3	Telstra New Zealand
4739	73	35	Commerical Internet eXchange
7617	72	26	One.Net
4804	70	12	Microplex (MPX-NOC)
4660	66	19	HANSOL Telecom Inc.
4808	63	51	Chinanet Beijing Site AS



Global routing table

Per AS prefix count summary

ASN	No of nets	/19 equiv	Description
701	1584	2991	ALTERNET
1221	904	1160	AARNET-AS
3561	853	2118	CWUSA
1	814	4606	BBN
2914	805	1390	VERIO
1239	693	1745	ICM-INRIA
174	679	2892	PSINET
7046	564	284	UUNET-CUSTOMER
7018	532	2925	ATT-INTERNET4
1785	508	884	ICM-1
209	462	522	ASN-QWEST
2764	437	117	CONNECT-NET
271	416	401	BCNET
6172	413	280	HOME-NET-1
4740	392	82	Ozemail
2907	389	941	SINET
3301	388	272	TeliaNet Sweden
4200	365	254	AGIS-NET
1257	338	250	SWIPNET

E-mail output - miscellaneous

List of Illegal AS's

Bad AS	Designation	Transit AS	Network
64867	PRIVATE	64200	166.105.208.0/24
64867	PRIVATE	64200	166.105.211.0/24
64333	RESERVED	10882	209.4.83.0/24
64333	RESERVED	10882	209.4.84.0/24

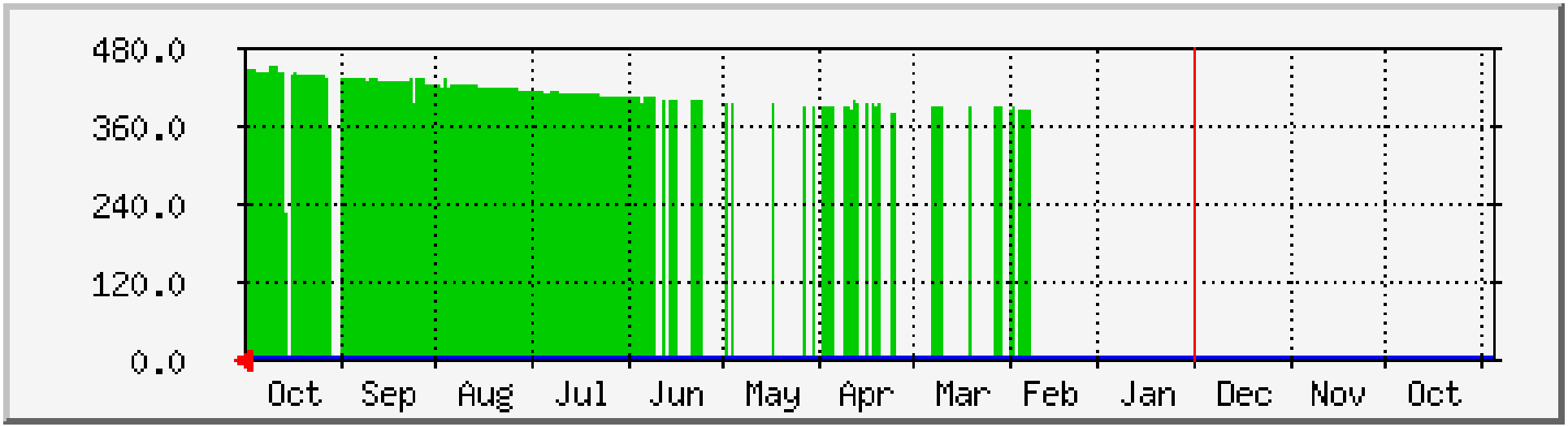
Number of networks announced per prefix in the Internet Routing Table

Default route not being announced..

/1 0	/2 0	/3 0	/4 0	/5 0	/6 0
/7 0	/8 23	/9 4	/10 5	/11 10	/12 27
/13 49	/14 146	/15 251	/16 6250	/17 679	/18 1339
/19 4348	/20 2368	/21 2807	/22 4041	/23 5564	/24 37889
/25 91	/26 141	/27 106	/28 89	/29 85	/30 88
/31 0	/32 72				

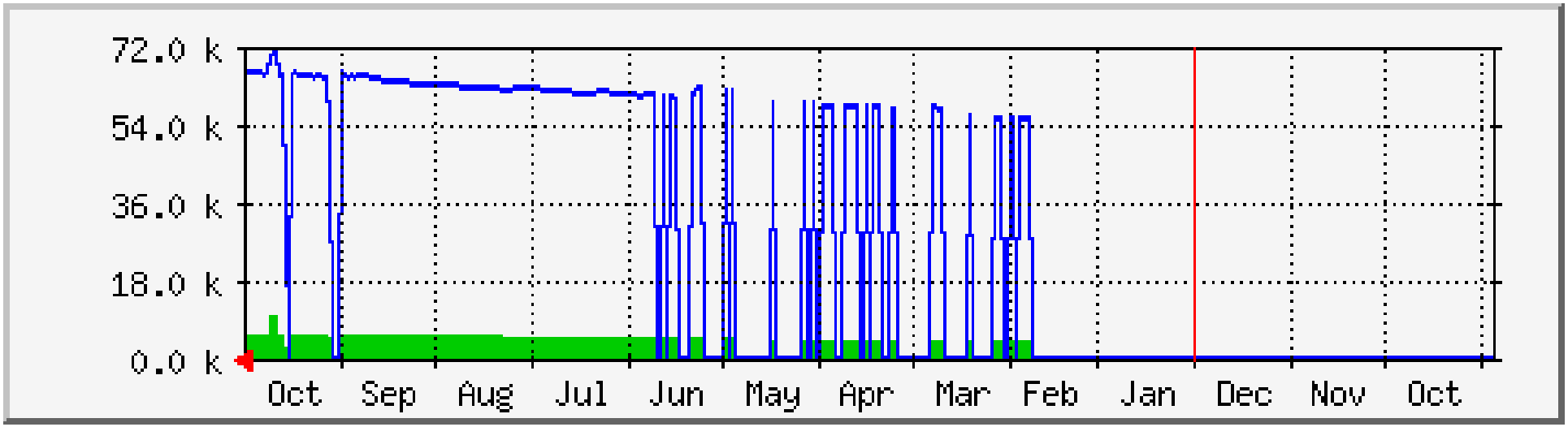
Trend graphs

Percentage/10 of APNIC allocated address space being announced



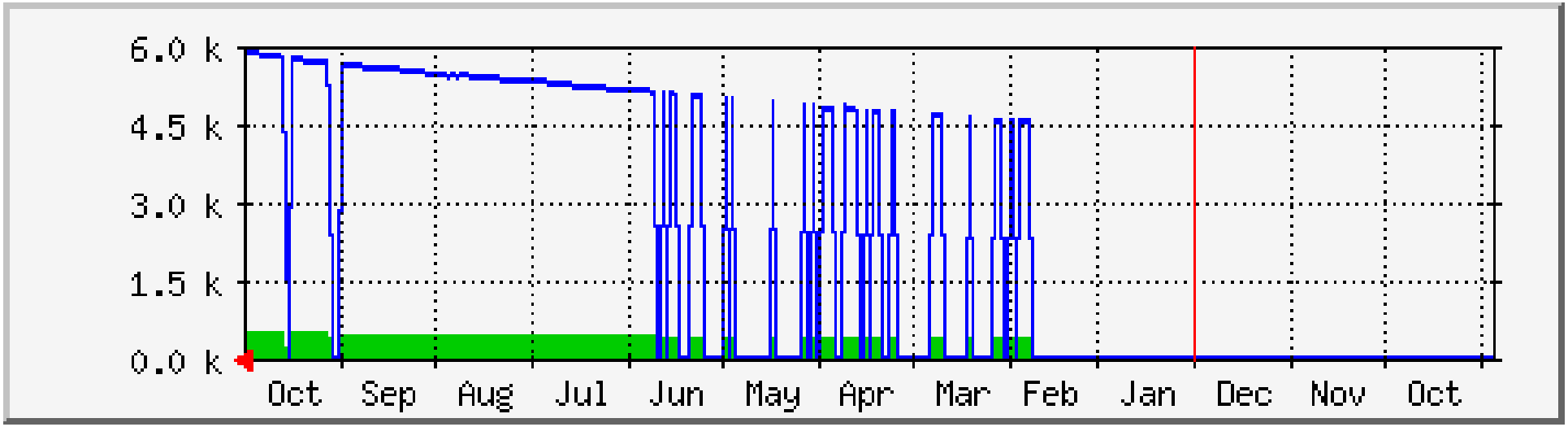
Trend graphs

APNIC routes announced (6449)
versus
Global routes announced (66391)



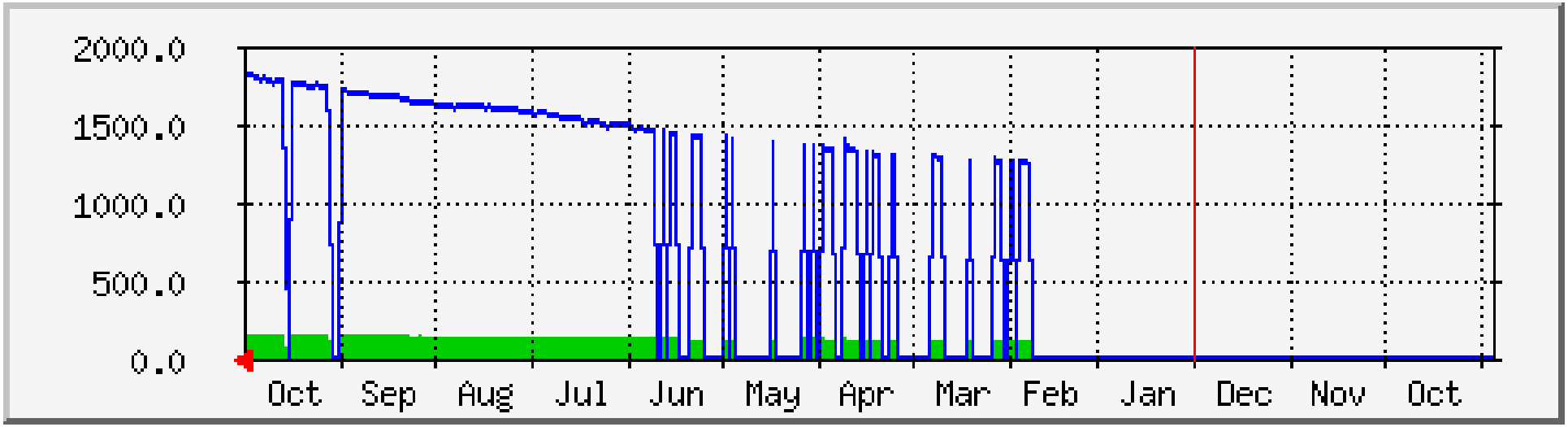
Trend graphs

APNIC origin ASes (564)
versus
Global origin ASes (5926)



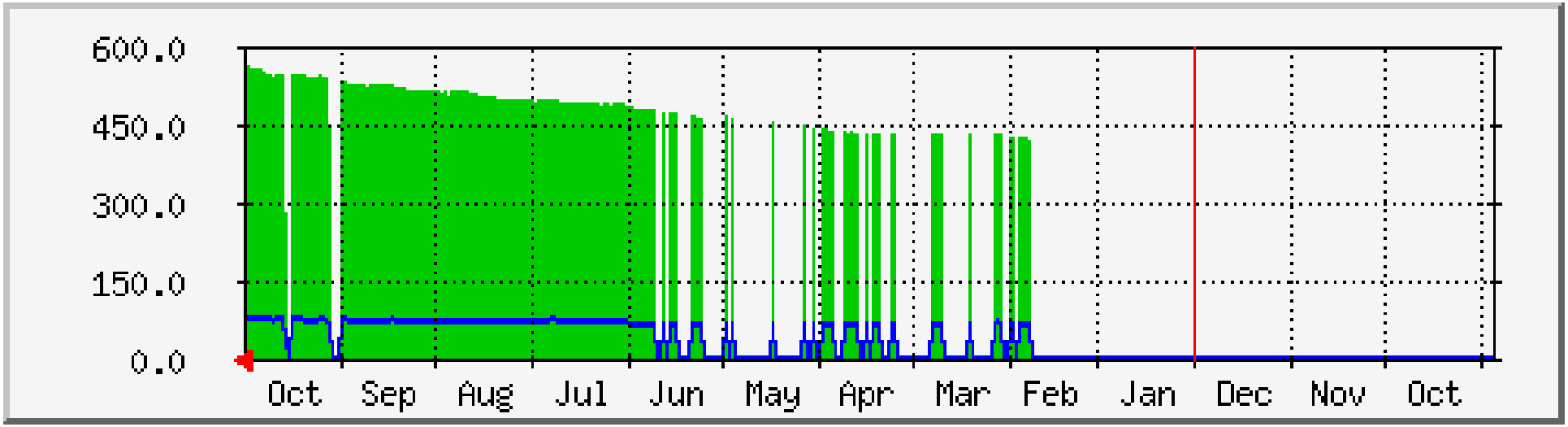
Trend graphs

APNIC ASes (175) announcing one prefix
versus
Global ASes (1824) announcing one prefix



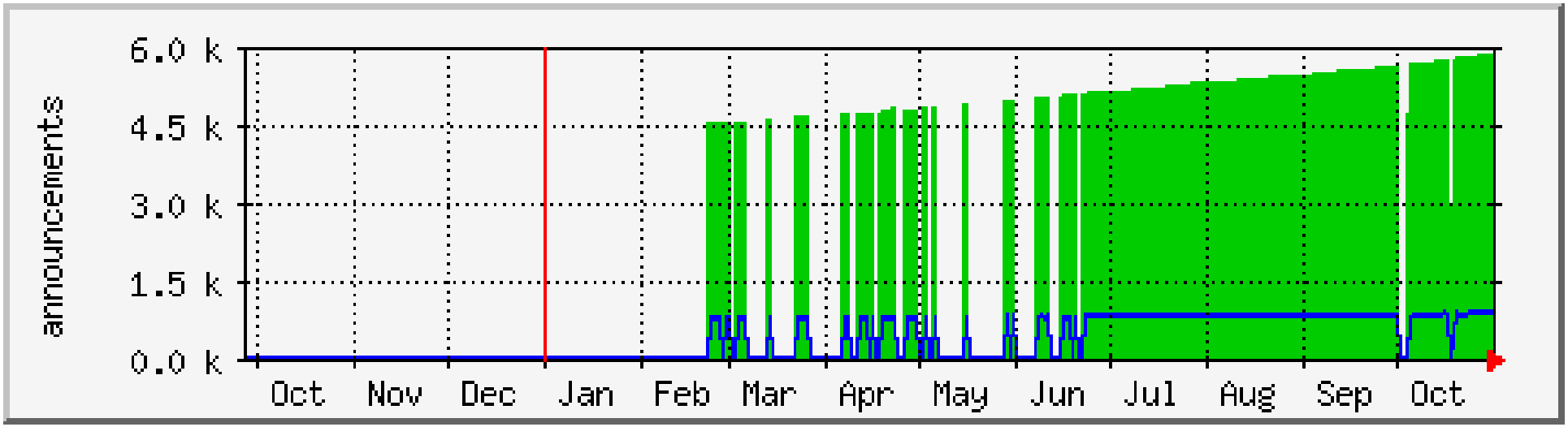
Trend graphs

APNIC origin ASes (564)
versus
APNIC transit ASes (80)



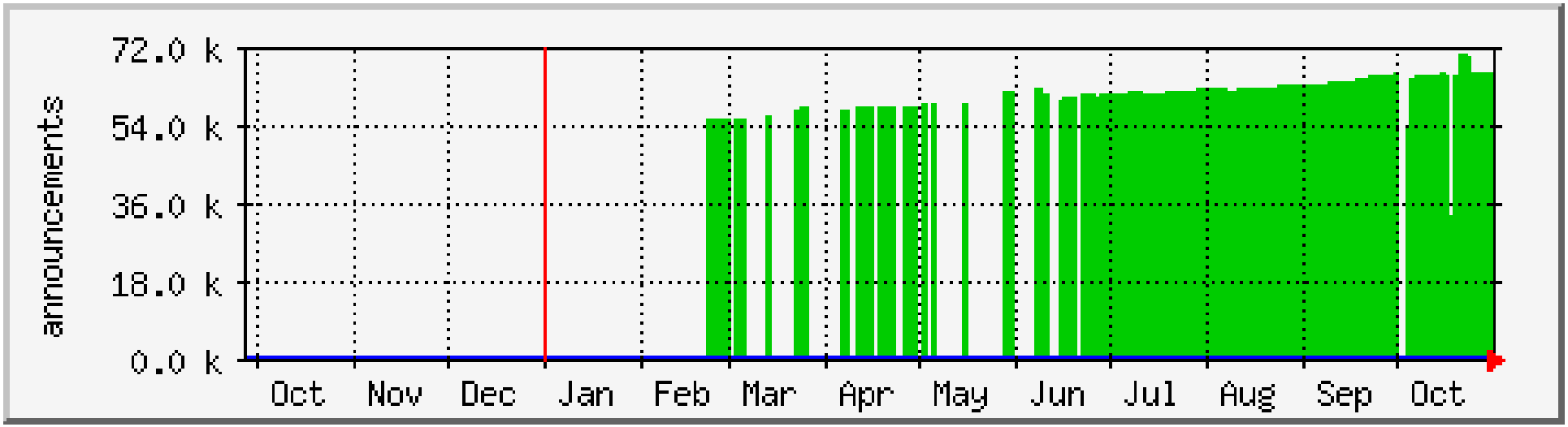
Trend graphs

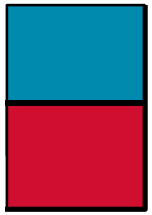
Internet origin ASes (5926)
versus
Internet transit ASes (918)



Trend graphs

Internet Routing Table Growth





For the future...

- **Publicise mailing list and web-page**

  or just post to apops@apnic.net?

- **European and American views?**
- **Other statistics?**
- **Other graphs?**
- **I've got a daily dump of the full routing table - what else is interesting?**