

Internet Routing Table Analysis Update



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APNIC Routing SIG

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Recent Changes

- Exhaustive search of 192/8 space for unassigned addresses
 - Now combined with IANA listing of former A-space and my search of former B-space
- Total available IPv4 address space outside registry blocks is now known “accurately”
 - Unallocated address space BGP feed available



Recent Changes (continued)

- Added LACNIC to report
 - Allocations from 200/8 address space
 - Allocations from AS blocks 26592 – 26623 and 27648 – 28671

Routing Report 26 February, 2003

BGP routing table entries examined	121542
Prefixes after maximum aggregation	77344
Unique aggregates announced to Internet	57960
Total ASes present in the Internet Routing Table	14706
Origin-only ASes present in the Internet Routing Table	12774
Origin ASes announcing only one prefix	5764
Transit ASes present in the Internet Routing Table	1932
Transit-only ASes present in the Internet Routing Table	67
Average AS path length visible in the Internet Routing Table	5.3
Max AS path length visible	17
Illegal AS announcements present in the Routing Table	15
Non-routable prefixes present in the Routing Table	0
Prefixes being announced from the IANA Reserved Address blocks	24
Number of addresses announced to Internet	1199237645
Equivalent to 71 /8s, 122 /16s and 234 /24s	
Percentage of available address space announced	32.4
Percentage of allocated address space announced	58.3
Percentage of available address space allocated	55.5
Total number of prefixes smaller than registry allocations	56810

Global per AS prefix count summary

ASN	No of nets	/20 equiv	Max Agg	Description
701	1614	8887	1150	UUNET Technologies, Inc.
7018	1427	7192	968	AT&T
3908	1244	1589	484	Supernet, Inc.
1221	1113	1135	813	Telstra Pty Ltd
1239	972	3135	686	Sprint
702	790	2248	652	UUNET - Commercial IP service
1	671	8087	435	GENUITY
852	603	1107	445	Telus Advanced Communications
7046	568	826	240	UUNET Technologies, Inc.
7843	564	402	209	Adelphia Corp.
4323	532	473	168	Time Warner Communications, I
4151	529	691	58	USDA
209	525	2091	333	Qwest
3561	501	2344	342	Cable & Wireless USA
690	498	73	308	Merit Network
7066	493	204	254	Virginia Polytechnic Institut
18566	488	114	7	Covad Communications
6197	479	449	137	BellSouth Network Solutions,
376	462	375	111	Reseau Interordinateurs Scien
705	450	165	196	UUNET Technologies, Inc.

Global Aggregation Savings Summary

ASN	No of Nets	Net Savings	Description
3908	1244	760	Supernet, Inc.
18566	488	481	Covad Communications
4151	529	471	USDA
7018	1427	459	AT&T
4323	532	364	Time Warner Communications, I
7843	564	355	Adelphia Corp.
376	462	351	Reseau Interordinateurs Scien
6197	479	342	BellSouth Network Solutions,
7046	568	328	UUNET Technologies, Inc.
11492	310	309	Cable One
1221	1113	300	Telstra Pty Ltd
6347	370	292	SAVVIS Communications Corpora
4355	402	290	EarthLink, Inc.
1239	972	286	Sprint
22927	295	281	TELEFONICA DE ARGENTINA
705	450	254	UUNET Technologies, Inc.
4814	264	249	China Telecom (Group)
7066	493	239	Virginia Polytechnic Institut
1	671	236	GENUITY
6198	428	232	BellSouth Network Solutions,

List of Illegal AS's

Bad AS	Designation	Network	Transit AS	Description
64512	PRIVATE	66.205.199.0/24	25752	Neopolitan Networks
64513	PRIVATE	66.205.200.0/24	25752	Neopolitan Networks
65021	PRIVATE	128.216.1.0/24	619	Department of Navy
65021	PRIVATE	128.216.4.0/24	619	Department of Navy
1877	UNALLOCATED	192.108.199.0/24	1880	Stupi, house man's p
64521	PRIVATE	198.189.23.0/24	2151	California State Uni
64521	PRIVATE	198.189.24.0/24	2151	California State Uni
64524	PRIVATE	198.189.134.0/24	2151	California State Uni
64524	PRIVATE	198.189.135.0/24	2151	California State Uni
64524	PRIVATE	198.189.136.0/24	2151	California State Uni
64524	PRIVATE	198.189.137.0/24	2151	California State Uni
64524	PRIVATE	198.189.138.0/24	2151	California State Uni
64521	PRIVATE	198.189.158.0/24	2151	California State Uni
64521	PRIVATE	198.189.235.0/24	2151	California State Uni
64521	PRIVATE	198.189.236.0/24	2151	California State Uni

- Significant event:

- AS5757 has been on this list for the last 2 years – now disappeared from routing table

Number of prefixes announced by prefix length

/1:0	/2:0	/3:0	/4:0	/5:0	/6:0
/7:0	/8:18	/9:6	/10:7	/11:12	/12:38
/13:92	/14:230	/15:392	/16:7125	/17:1398	/18:2462
/19:7229	/20:6518	/21:4800	/22:7180	/23:8925	/24:60019
/25:209	/26:217	/27:122	/28:77	/29:69	/
30:63	/31:0	/32:24			

February 2002 ↑

February 2003 ↓

Number of prefixes announced by prefix length

/1:0	/2:0	/3:0	/4:0	/5:0	/6:0
/7:0	/8:18	/9:3	/10:8	/11:12	/12:46
/13:92	/14:239	/15:446	/16:7344	/17:1594	/18:2893
/19:8154	/20:8067	/21:5785	/22:8758	/23:10493	/24:66729
/25:168	/26:174	/27:101	/28:97	/29:61	/30:161
/31:2	/32:97				

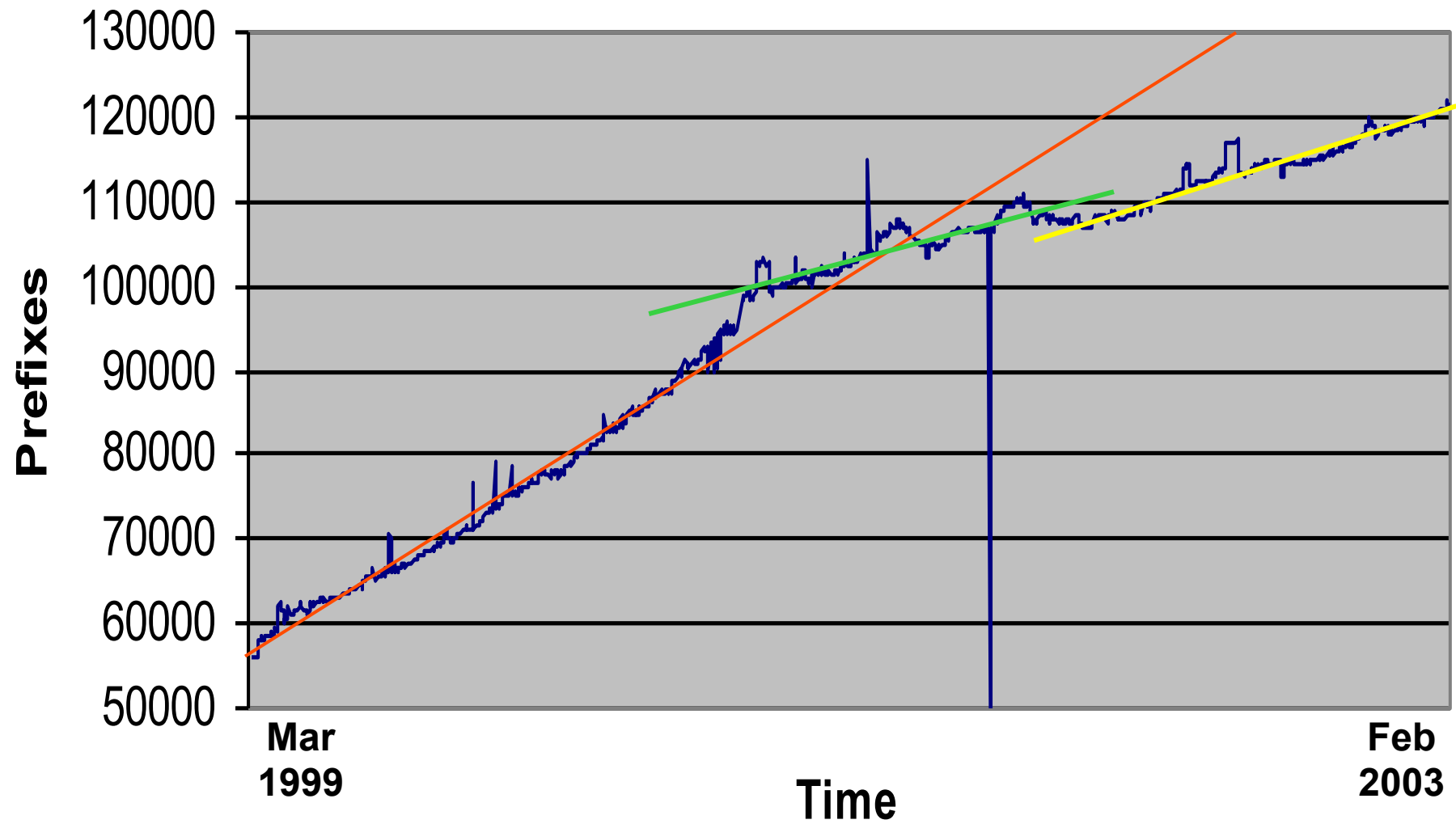
Advertised IANA Reserved Addresses

Network	Origin AS	Description
39.0.0.0/8	4554	Exchange Point Blocks
132.0.0.0/10	568	DISO-UNRRA
135.0.0.0/13	10455	Lucent Technologies
137.0.0.0/13	568	DISO-UNRRA
158.0.0.0/13	568	DISO-UNRRA
192.31.242.0/24	771	NASA Ames Research Center
192.44.0.0/19	702	UUNET - Commercial IP service
192.83.16.0/20	5515	Sonera Solution Autonomous Sy
192.83.32.0/19	5515	Sonera Solution Autonomous Sy
192.83.96.0/22	5515	Sonera Solution Autonomous Sy
192.83.100.0/24	5515	Sonera Solution Autonomous Sy
192.119.135.0/24	270	NASA
192.135.50.0/24	7018	AT&T
192.136.79.0/24	719	LANLINK autonomous system
192.136.86.0/24	719	LANLINK autonomous system
192.136.87.0/24	719	LANLINK autonomous system
192.136.88.0/24	719	LANLINK autonomous system
192.153.136.0/21	568	DISO-UNRRA
192.156.164.0/24	19548	Adelphia Business Solutions
192.172.0.0/19	568	DISO-UNRRA
192.243.36.0/23	2044	AUSNet Inc.

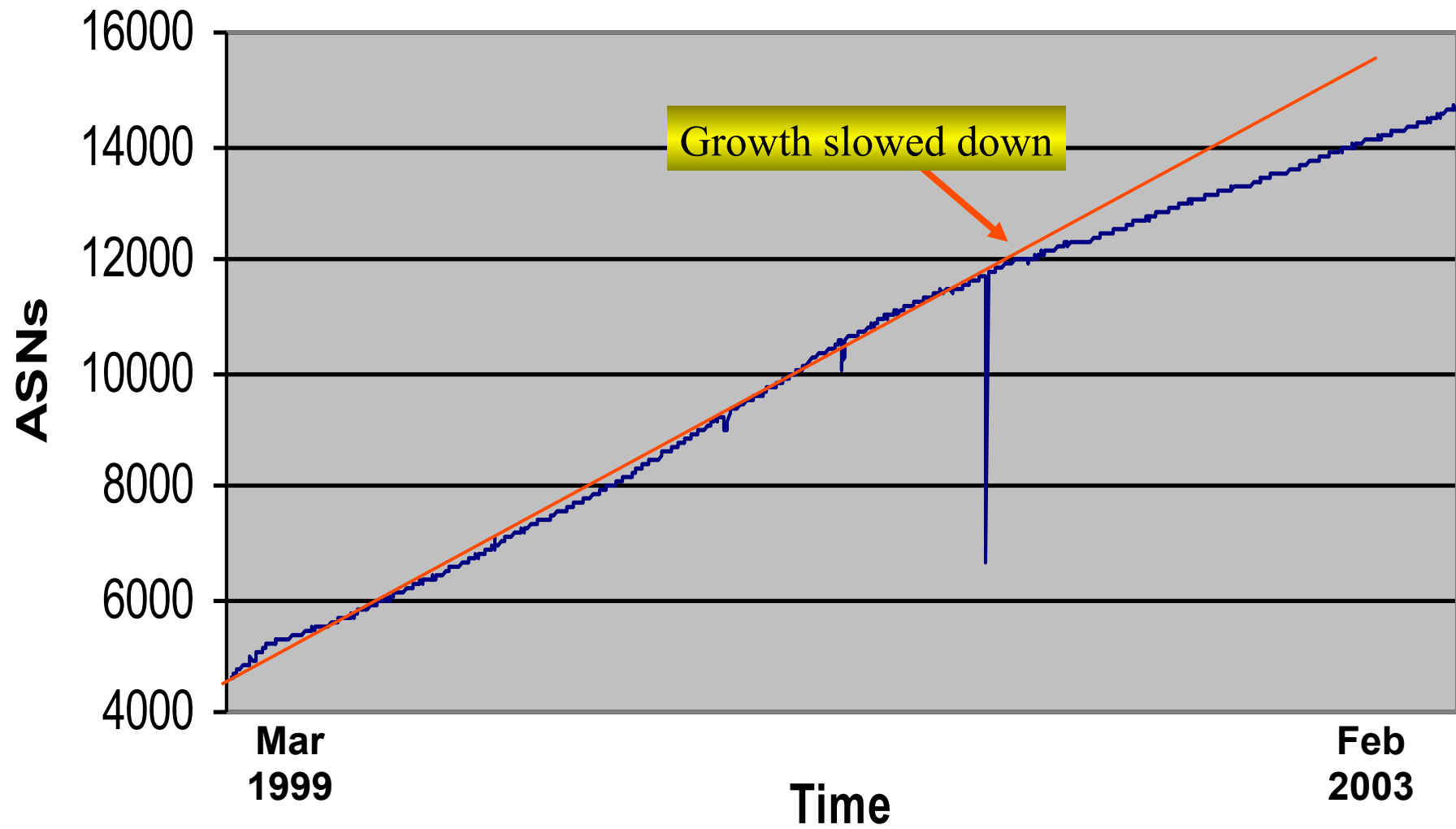
Prefixes Smaller than Registry Allocations

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3908	815	1244	Supernet, Inc.
7018	525	1427	AT&T
702	495	790	UUNET - Commercial IP service
18566	483	488	Covad Communications
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690	447	498	Merit Network
7066	392	493	Virginia Polytechnic Institut
1239	363	972	Sprint
6197	355	479	BellSouth Network Solutions,
6198	337	428	BellSouth Network Solutions,
7843	334	564	Adelphia Corp.
11492	309	310	Cable One
22927	294	295	TELEFONICA DE ARGENTINA
6140	271	284	ImpSat
7046	271	568	UUNET Technologies, Inc.
20115	257	382	Charter Communications
2386	242	445	AT&T Data Communications Serv
3215	239	314	France Telecom Transpac
7303	239	240	Telecom Argentina Stet-France
4355	229	402	EarthLink, Inc.

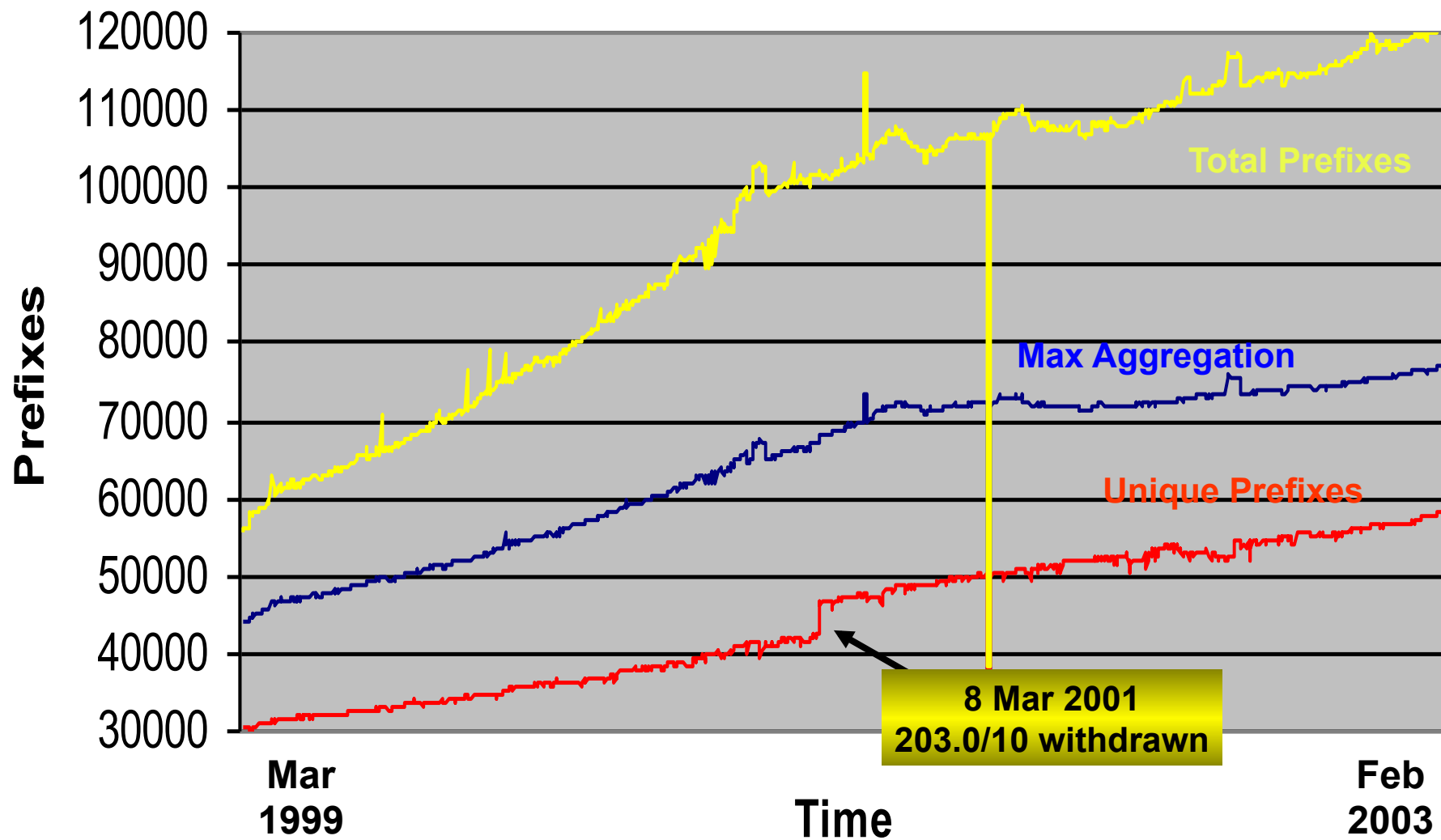
BGP Routing Table



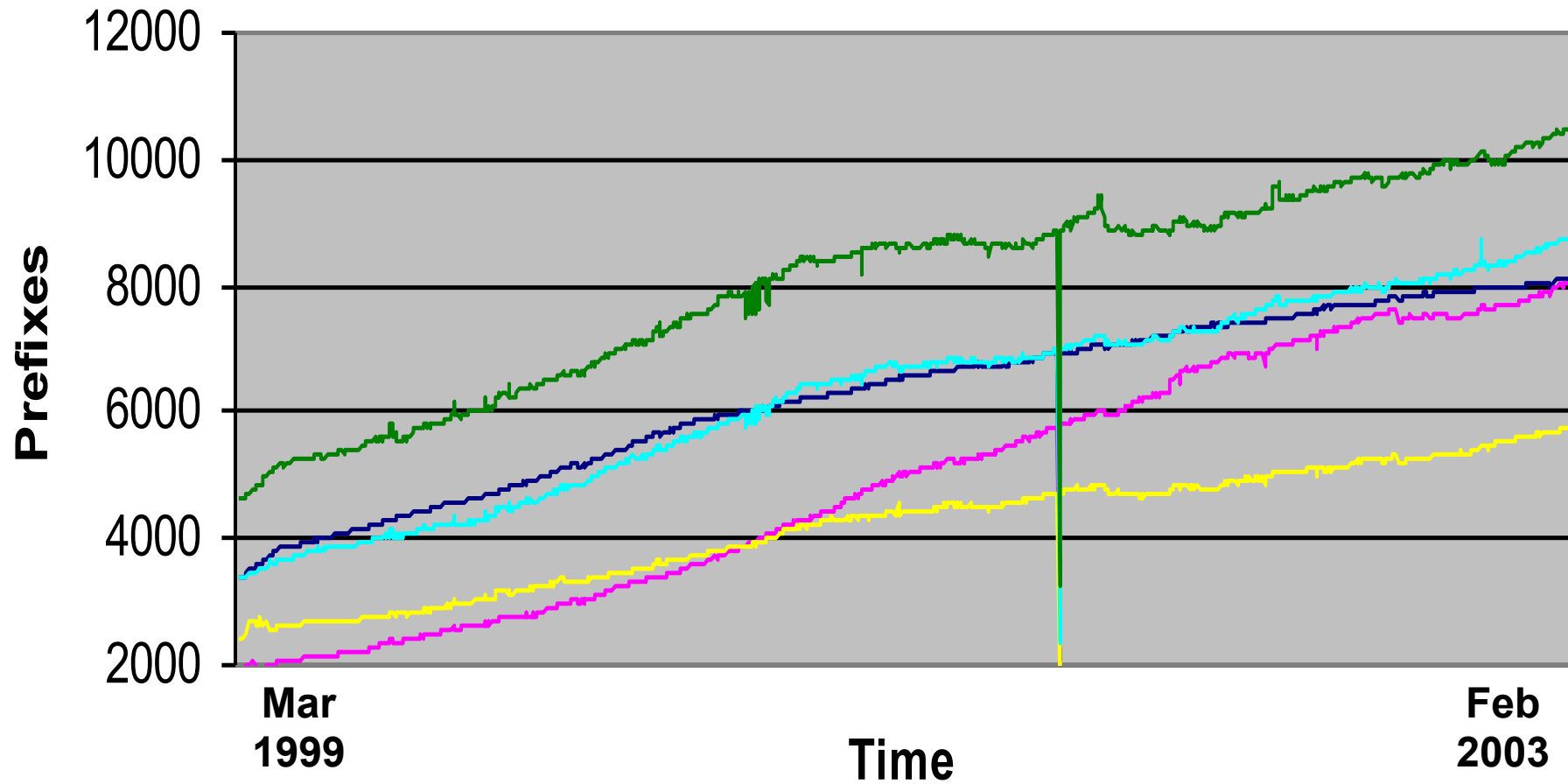
AS Growth



Unique Prefixes vs Max Aggregation

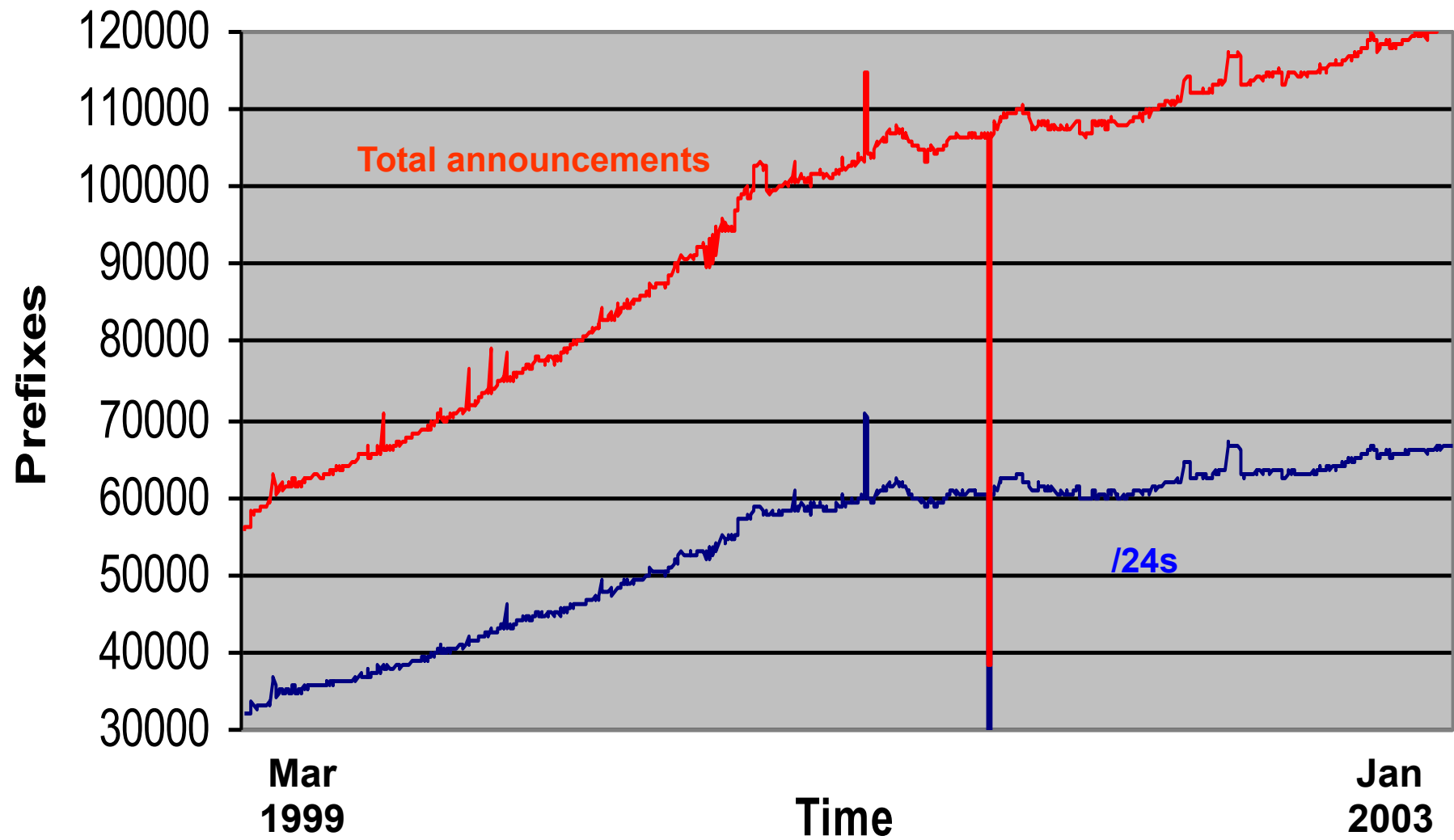


Prefixes sizes announced

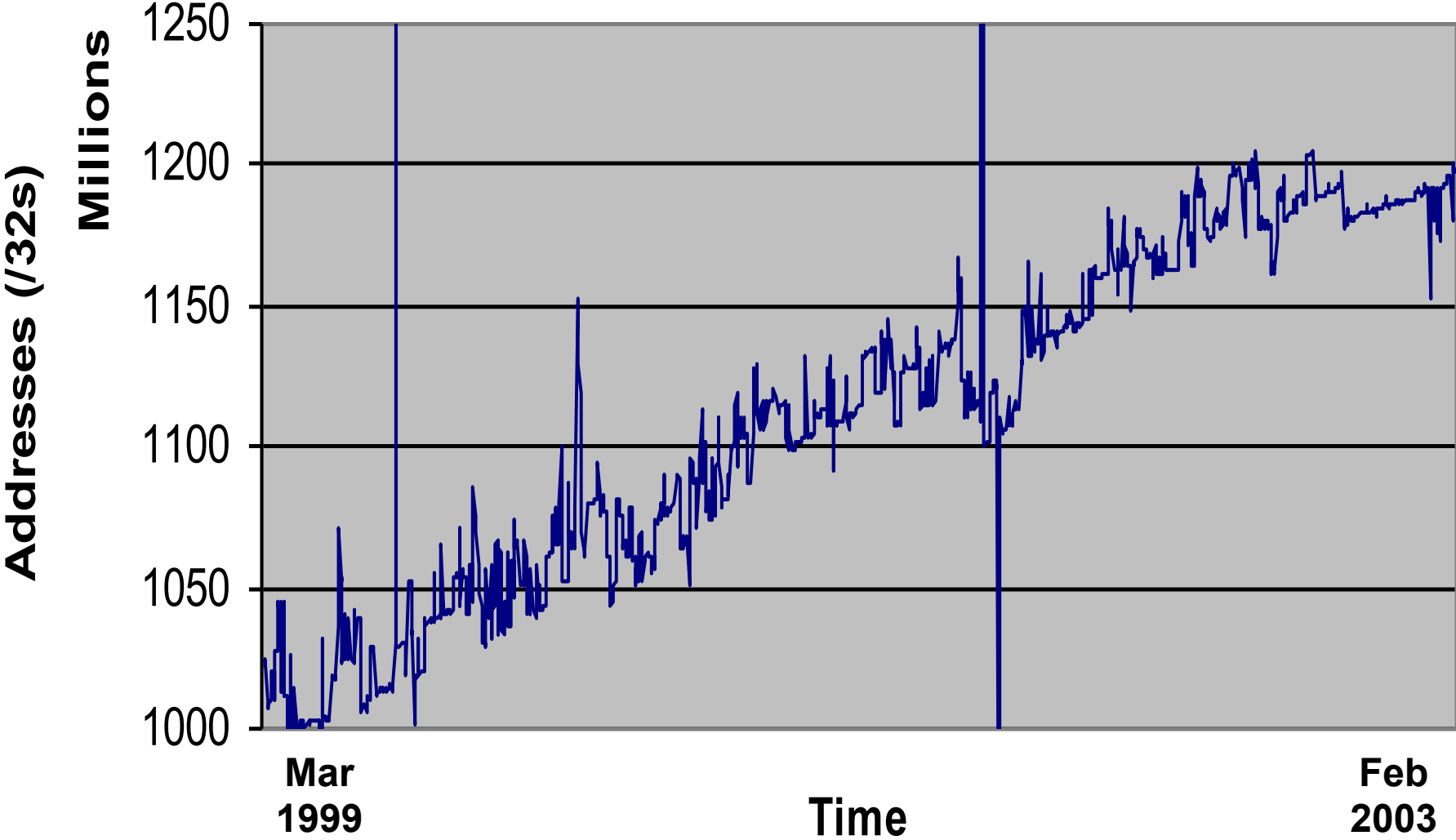


— /19s — /20s — /21s — /22s — /23s

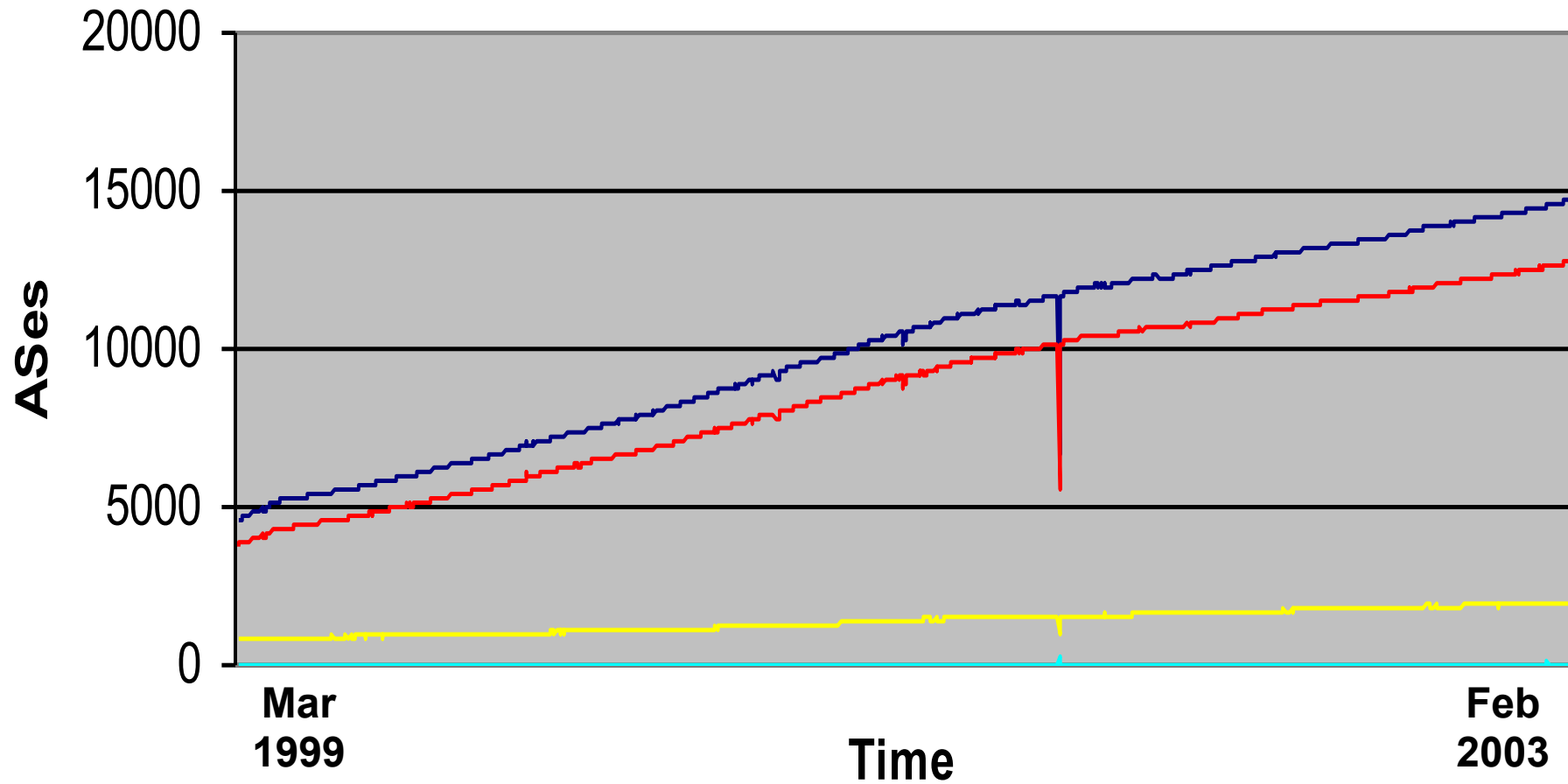
/24s announced



Address Space announced



AS Announcements



— Total — Origin Only — Transit — Transit Only

Internet Routing Table Analysis Update



Questions?