4 Byte AS Number Update

Geoff Huston

August 2008
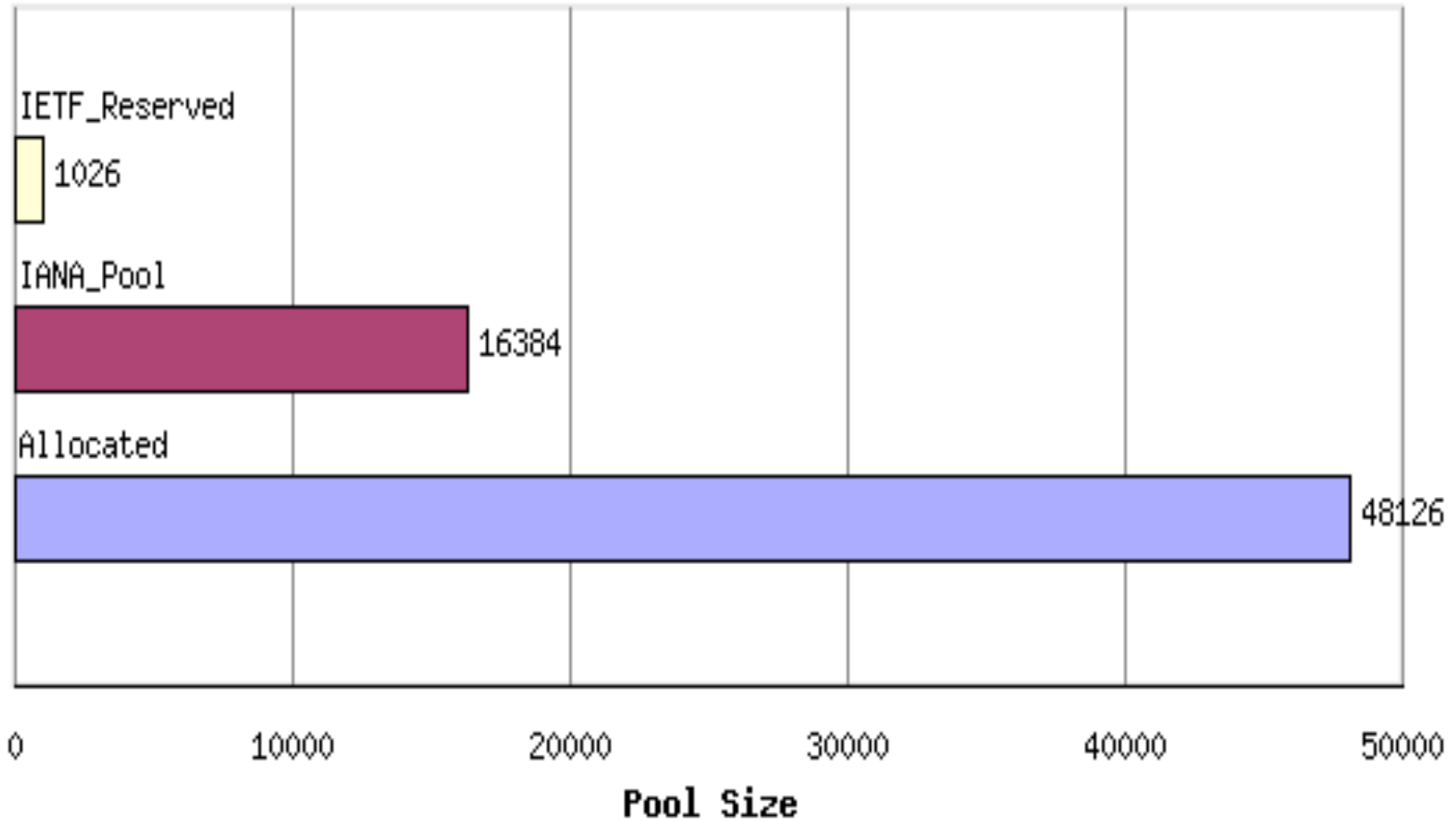
The story so far …

- 16 bit AS number field defined by BGP
- Used in BGP for
  - peer identification
  - path metric calculation
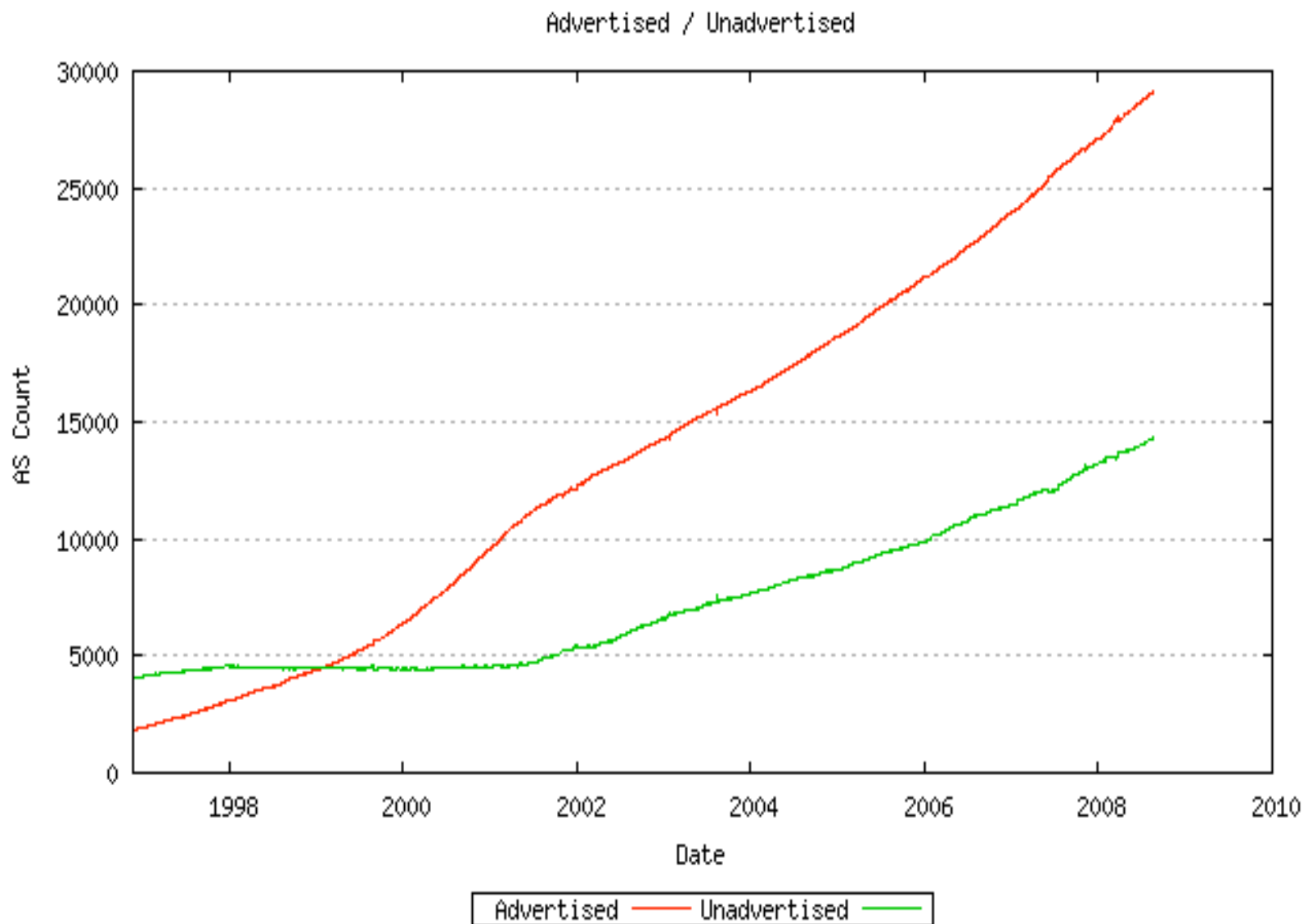 - loop detection

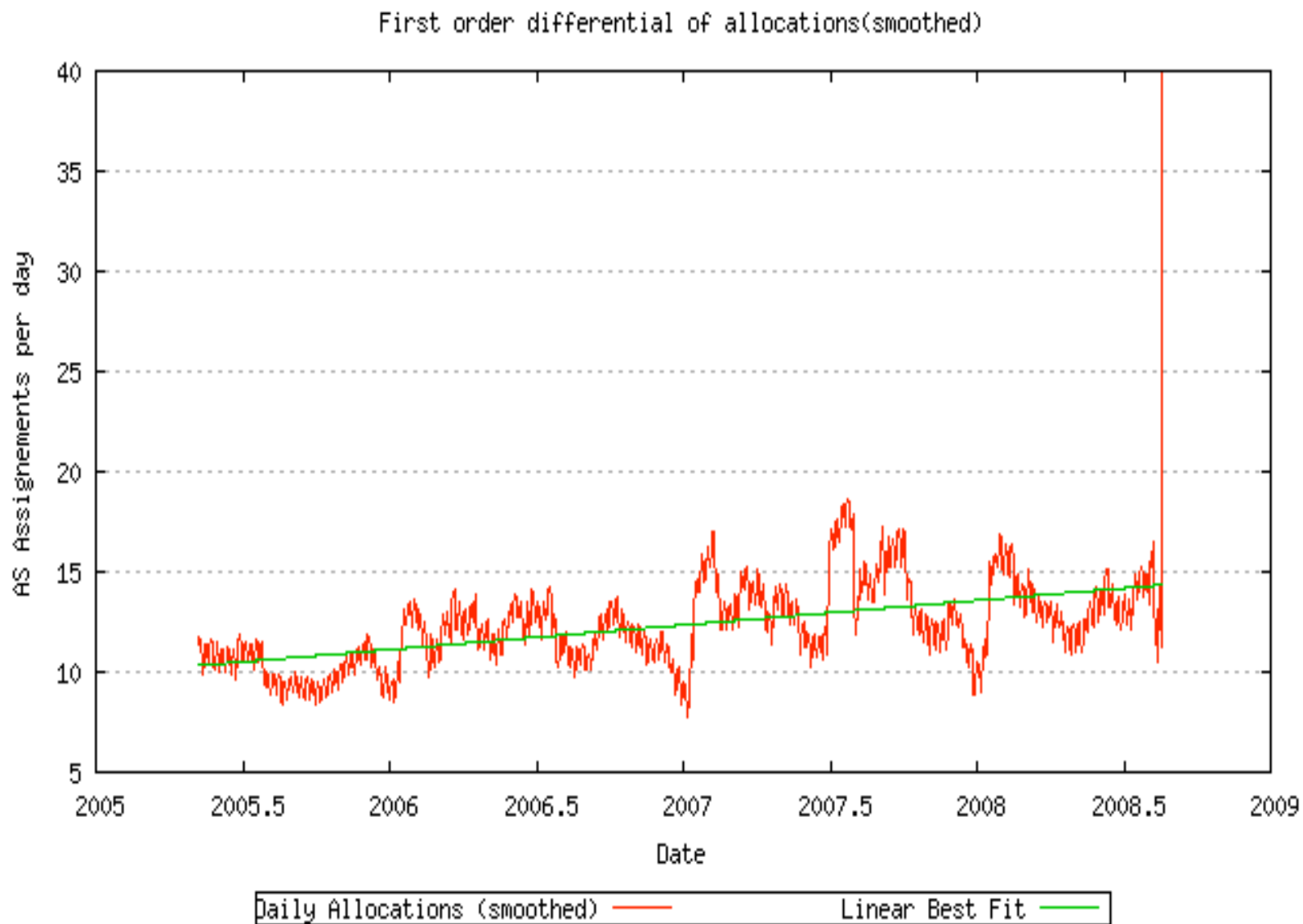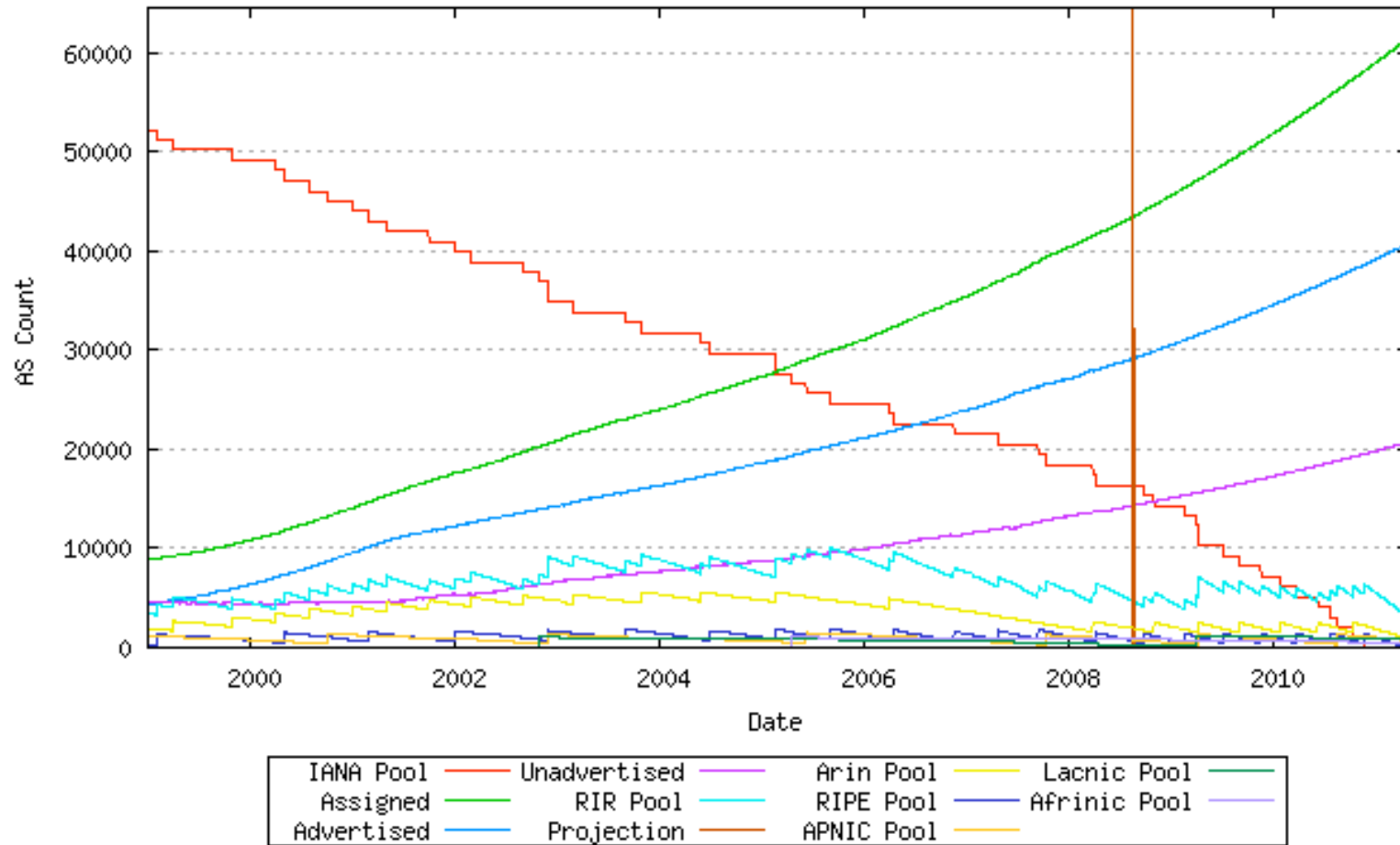# 16-bit AS Number Pool Status

AS Number Pool Status

IETF_Reserved 1026

IANA_Pool 16384

Allocated 48126

16-bit AS Number Pool Status

16-bit AS Number Consumption

Advertised / Unadvertised

16-bit AS Number Consumption

First order differential of allocations(smoothed)

16-bit AS Number Consumption

Crunch Time

24 April 2011

http://www.potaroo.net/tools/asn16/

The IETF had a plan …

- Adjust BGP to use 32-bit AS numbers

The IETF had a plan …

- Adjust BGP to use 32-bit AS numbers

- Make the adjustment backward compatible:
  - use AS 23456 as a "token holder" for backward compatibility
  - no existing BGP deployments need to change at all - the Internet will Just Work throughout the transition
  - Use "new" BGP for new routing domains that use these extended length 32-bit AS numbers

The IETF had a plan …

- Adjust BGP to use 32-bit AS numbers
- Make the adjustment backward compatible:
    - use AS 23456 as a "token holder" for backward compatibility
    - no existing BGP deployments need to change at all - the Internet will Just Work throughout this transition
    - Use "new" BGP for new routing domains that use these extended length 32-bit AS numbers

- ## IANA to open up a 32-bit AS number registry

The IETF had a plan …

- Adjust BGP to use 32-bit AS numbers
- Make the adjustment backward compatible:
  - use AS 23456 as a "token holder" for backward compatibility
  - no existing BGP deployments need to change at all - the Internet will Just Work throughout this transition
  - Use "new" BGP for new routing domains that use these extended length 32-bit AS numbers
- IANA to open up a 32-bit AS number registry

- **Published as a Proposed Internet Standard: RFC 4893**

–The RIRs had a policy ...

- Start allocating 32-bit only AS numbers as of 1 January 2007
  - but only upon request
  - and you get a 16 bit AS number otherwise

The RIRs had a policy …

- Start allocating 32-bit only AS numbers as of 1 January 2007
  - but only upon request
  - and you get a 16 bit AS number otherwise

- Flip the bits on 1 January 2009
  - 16 bit AS numbers still available if you ask for them
  - otherwise you get a 32-bit only AS number

The RIRs had a policy …

- Start allocating 32-bit only AS numbers as of 1 January 2007
    - but only upon request
    - and you get a 16 bit AS number otherwise
- Flip the bits on 1 January 2009
    - 16 bit AS numbers still available if you ask for them
    - otherwise you get a 32-bit only AS number

- **Drop the distinction on 1 January 2010**
    - They are all just one big pool of AS numbers once more

Policy Objectives

- Provide vendors, suppliers, ISPs and others ample time to implement 32-bit support in BGP and related operational support systems that manipulate AS numbers

Policy Objectives

- Provide vendors, suppliers, ISPs and others ample time to implement 32-bit support in BGP and related operational support systems that manipulate AS numbers

- Set forth clear dates in terms of milestones in the transition to 32-bit AS numbers

Policy Objectives

- Provide vendors, suppliers, ISPs and others ample time to implement 32-bit support in BGP and related operational support systems that manipulate AS numbers
- Set forth clear dates in terms of milestones in the transition to 32-bit AS numbers

- Encourage advance planning and avoid disruptive exhaustion of the 16-bit AS number pool prior to general availability of 32-bit AS support in BGP and related systems

How are we doing?

August 2008 AS statistics

- **88** Allocated 32-bit only AS numbers
  (Total of 43,670 allocated AS numbers)

- **12** Advertised 32-bit only AS numbers
  (Total of 28,909 advertised AS numbers)

131072	2.0
131074	2.2
131075	2.3
131076	2.4
131078	2.6
131079	2.7
131081	2.9
196611	3.3
196621	3.13
196624	3.16
327681	5.1
393219	6.3

No general 32-bit BGP adoption yet

- Vendor situation is still lagging for 32 bit AS number support in BGP
  - My current understanding of vendor support:

    Cisco: IOS-XR 3.4

    Juniper: JUNOSe 4-1-0

    Redback

    others: ?

  - Open Source BGP:

    Quagga 0.99.10

    OpenBGPd

Some Timely Questions

- Are your operational support systems capable of supporting 32-bit AS numbers?
  - Can you support customers / peers / upstreams peering with you when they use 32-bit AS numbers?
  - Can you cope with multiple AS 23456 BGP peers?

Some Timely Questions

- Are your operational support systems capable of supporting 32-bit AS numbers?
    - Can you support customers / peers / upstreams peering with you when they use 32-bit AS numbers?
    - Can you cope with multiple AS23456 BGP peers?

- If you intend to use BGP for a new domain does your router vendor support 32-bit AS number support in BGP?

For more information …

http://www.apnic.net/community/research/as-numbers/

For more information …

http://wiki.icons.apnic.net/display/ASN/Home

Thank You

Questions?