Experiencias con ASN de 32bits en el mundo real

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AS de 4Bytes Hoy

- Prefijos generados desde un AS de 4 Bytes o que utilizan un AS de 32bits para transito (32 prefijos)

    - 62.48.31.0/24, 69.31.100.0/24, 84.205.64.0/24, 84.205.80.0/24, 91.201.176.0/22, 91.207.218.0/23, 91.208.44.0/24, 91.209.249.0/24, 91.212.5.0/24, 91.212.87.0/24, 94.47.253.0/24, 95.130.8.0/21, 95.130.144.0/21, 95.215.96.0/22, 95.215.144.0/22, 95.215.176.0/22, 110.44.16.0/22, 169.222.0.0/24, 187.49.144.0/20, 193.5.68.0/23, 193.31.7.0, 193.53.83.0, 195.47.195.0, 195.88.52.0/23, 195.88.68.0/23, 195.88.112.0/23, 195.88.154.0/23, 196.1.15.0, 196.200.208.0/20, 197.255.248.0/22, 202.255.47.0, 208.131.173.0

¿Por qué?

- Los ASN de 16 bits se agotan

- Desde el 1 de Enero de 2009 por defecto se asignan ASN de 32 bits

- RIPE dejará de dar ASN de 16 bits

Problemas

- Actualizaciones de Software

- Formátos Numéricos

- Nuevos Atributos de BGP

- Configuración en Cisco

Actualizaciones de Software

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Software Support

These versions of software support 32-bit ASNs.

http://as4.cluepon.net/index.php/Software_Support

Software

Name	Version	Notation
Alcatel-Lucent SR OS	7.0	asplain
Arbor Peakflow SP	5.5	asplain
BIRD	1.0.12	asplain
Brocade (Foundry) IronWare	4.0.00 for the NetIron MLX and XMR, 2.8.00 for the BigIron RX	asdot, asdot+, asplain
Cisco IOS	12.0(32)S12, 12.2(33)SXI1, 12.4(24)T	asplain (asdot optional)
Cisco IOS XE	2.3	asplain (asdot optional)
Cisco IOS XR	3.4(1)	asdot (asplain planned for 3.9)
Cisco NX-OS	4.0(1)	asdot (asplain planned for 4.1(3))
ExtremeXOS	Need Information	Need Information
Juniper JUNOS	9.1R1	asplain (asdot optional)
Juniper JUNOSe	4.1.0	asplain
Force10 FTOS	7.7.1.0	asdot (asdot+, asplain optional)
OpenBGPD	4.2, patches for 3.9 and 4.0	asdot
Quagga	0.99.10, patches for 0.99.6 and other versions	asplain
Redback SEOS	2.0	ascolon (asplain planned for end of 2009)

Tools

- RIR whois
- IRRd accepts and indexes asdot format AS numbers from mirrored databases, but the parser for submissions to local databases does not yet accept 32-bit ASNs
- NetFlow v9 and sFlow v5 both support 32-bit ASNs, but the router needs to fill in the 32-bit ASN and the collector needs to understand them

Formatos numéricos

- Según la RFC5396 (Textual Representation of Autonomous System (AS) Numbers) (Dic. 2008)
    - asplain: Número entero (100, 65546)
    - asdot+: Dos enteros con punto (0.100, 1.10)
    - asdot: Mix de ambas (100, 1.10)
        - < 65536 = asplain
        - ≥ 65536 = asdot +

Nuevos atributos de BGP

- Según la RFC4893 (BGP Support for Four-octet AS Number Space) (Mayo 2007)
  - AS4_PATH (NEW_AS_PATH)
  - AS4_AGGREGATOR

```
▽ Border Gateway Protocol
  ▽ UPDATE Message
       Marker: 16 bytes
       Length: 69 bytes
       Type: UPDATE Message (2)
       Unfeasible routes length: 0 bytes
       Total path attribute length: 41 bytes
  ▽ Path attributes
     ▷ ORIGIN: IGP (4 bytes)
     ▷ AS_PATH: 23456 (7 bytes)
     ▷ NEXT_HOP: 11.0.0.2 (7 bytes)
     ▷ MULTI_EXIT_DISC: 0 (7 bytes)
     ▷ LOCAL_PREF: 100 (7 bytes)
     ▷ NEW_AS_PATH: 196641 (9 bytes)
  ▷ Network layer reachability information: 5 bytes
```

NEW_AS_PATH

- Introducido en el Draft de Junio de 2005 "BGP support for four-octet AS number space"

    - *NEW_AS_PATH.* **This attribute is optional transitive and contains the AS path encoded with 4-octets AS numbers. The NEW_AS_PATH attribute has the same semantics as the AS_PATH attribute**, *except that it is optional transitive, and it carries 4-octets AS numbers.... AS_PATH is a well-known mandatory attribute*

AS4_AGGREGATOR

- ## Según la RFC4893

    - *Similarly, this document defines a new aggregator attribute called AS4_AGGREGATOR, which is optional transitive. The AS4_AGGREGATOR attribute has the same semantics as the AGGREGATOR attribute, except that it carries a 4-octet AS number.*

Configuración en Cisco

```
Router(config)#router bgp ?

  <1-65535>     AS of remote neighbor

  <1.0-XX.YY>   4 octets AS of remote neighbor

Router(config-router)#neighbor 10.0.0.1 remote-as ?

  <1-65535>     AS of remote neighbor

  <1.0-XX.YY>   4 octets AS of remote neighbor
```

Router(config)#router bgp 16371

Router(config-router)#neighbor 10.0.0.1 remote-as 1.10

```
OJO: Esto sólo es así con versión que soporte ASN 32 bits
```

Demo y Problema Confederación