

AS (Autonomous System):

- o In the world of BGP, each routing domain is known as an Autonomous System, or AS.
- o Like IP addresses, Autonomous System Numbers have to be unique on the Internet.
- o An Autonomous System is collection of networks under single administrative domain.
- o The Internet is nothing more, but a bunch of AS that are connected to each other.
- o Within an Autonomous System, we are using an IGP like OSPF, RIP, ISIS or EIGRP etc.
- o Between the different Autonomous Systems, use an External Gateway Protocol (BGP).
- o BGP uses the Autonomous System (AS) number for its loop prevention mechanism.
- o Autonomous System numbers are 16-Bit or 2-Octet Autonomous System numbers.
- o 2 Byte AS number provides us with 65,536 possible numbers (AS numbers 0 – 65535).
- o In Which there is total 65535 numbers of Autonomous System (AS) to choose from.
- o An extension has been created that supports 32-Bit or 4-Octet or 4-Bytes AS numbers.
- o It means total about 4294967296 Autonomous System (AS) numbers to choose from.
- o The 2-byte AS number, also known as the 16-bit AS number or the 2-Octet AS number.
- o 2-Byte Autonomous System (AS) numbers is in the range of from 1 to 65535.
- o Due to fast depletion of 2 bytes AS number, 4 bytes AS numbers have been introduced.
- o 4-Byte Autonomous System Number (ASN) provides us with 4.3billion unique ASN's.
- o 4-Byte Autonomous System (AS) numbers is in the range of 65536 to 4294967295.
- o The 4-Byte AS Number range from 64,512 through 64534 is reserved for private use.
- o If BGP peering one router supports the new format and the other one only the old one.
- o New reserved ASN 23456 is used for backward compatibility between 4-bytes & 2-bytes.

There is range of public and private Autonomous System numbers (ASN).

AS Range	Purpose	Total AS
0	Reserved	1
1 – 64495	Public AS Numbers	64495
64496 – 64511	Reserved to use in Documentation	15
66512 – 65534	Private AS Numbers	1022
65535	Reserved	1

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1 – 64495	Public AS Numbers	64495
64496 – 64511	Reserved to use in Documentation	15
66512 – 65534	Private AS Numbers	1023
65535	Reserved	1
4200000000 - 4294967294	Private AS Numbers	94,967295

There are three ways to write down these new 4-Byte AS numbers.

Asplain:

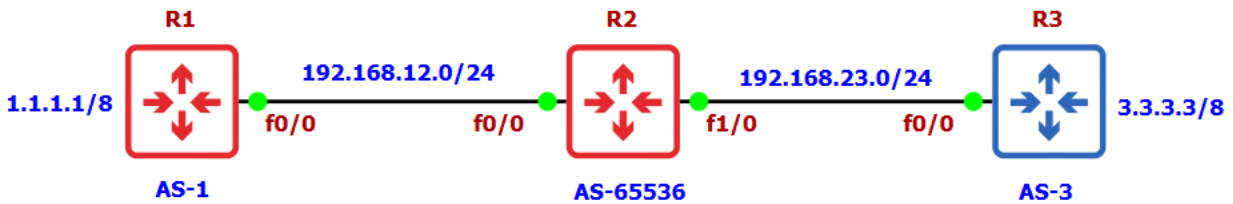
- o **Asplain** is the simplest to understand, these are just **regular decimal numbers**.
- o Simple decimal representation, for example, ASN 7747 will be represented as 7747.
- o Simple decimal representation, while 123456 will be represented as 123456.

Asdot+:

- o Asdot+ breaks the number up in two 16-bit values as low-order and high-order.
- o All the 2-byte Autonomous System numbers represented in the low-order value.
- o For example, ASN 65535 will be 0.65535, 65536 will be 1.0, 65537 will be 1.1 etc.
- o The last Autonomous System numbers (ASN) 4294967296 will be 65535.65535.

Asdot:

- o Asdot notation is basically, the mixture of asplain and asdot+ notations.
- o Asdot represents AS numbers less than 65536 using the Asplain notation.
- o Any ASN in 2-byte range is represented as asplain and any ASN above is asdot+.
- o For example, 65535 will be 65535 while 65536 will be 1.0, Cisco uses this format.
- o Autonomous System (AS) numbers above the 65536 with the asdot + notation.



Below, Link to convert AS-PLAIN number to AS- DOT number.

<http://labs.spritelink.net/ascalc>

BGP ASN - AS-PLAIN to AS-DOT (and AS-COLON) calculator and back

If you know what AS-DOT and what AS-PLAIN is, you know why you might want this calculator :) Oh and if you are a RedBack user, you'll be suffer It's just the same as AS-DOT, but with a colon (:) instead of the dot (.), alas the name ;)

AS-PLAIN number: << >> AS-DOT number: .

So, let's take the number 65546 to convert it to ASDOT Format.

1. $65546 / 65535 = 1$ (integer) which will be the part in front of the . (dot) in ASDOT .
2. $65546 - (65535 * 1) = 11$ (see how much rest remains after 65535 going once in 65546)
3. $11 - 1 = 10$ which will be the part after the . (dot)
4. Finally, to obtain 1.10

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AS-PLAIN number:  << >> AS-DOT number: .

You take 65535 and see how many times it goes, with integer in the ASPLAIN number (1 time, 2 times, 3 times...depending). This will be your decimal number before dot in ASDOT format . Then you multiple the 65535 with the integer obtained in the first step and you deduct from the ASPLAIN number. From the rest after the second operation, you deduct the decimal you have in front of the dot. The rest in decimal that comes after the dot .

So, let's take the number 194534 to convert it to ASDOT Format.

1. $194534 / 65535 = 2$ (integer)
2. $194534 - (65535 * 2) = 194534 - 131070 = 63464$
3. $63464 - 2 = 63462$
4. ASDOT = 2.63462

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