

# Short IPv6

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# Short IPv6



- ::
- ::1
- 2600::



# Let's count

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- <https://www.iana.org/assignments/ipv6-address-space/ipv6-address-space.xhtml>
- 2000::/3 - Global Unicast
  - XXXX::
  - 13 bit - 8192
- Allocated
  - 133 total
  - <https://www.iana.org/assignments/ipv6-unicast-address-assignments/ipv6-unicast-address-assignments.xhtml>
- Documentation
  - 3fff::/20

# Let's count

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IANA	2	2001::/23 (Teredo), 2002::/16 (6to4)
AFRINIC	16	2c00::/12
APNIC	32	2400::/12, 2410::/12
ARIN	34	2600::/12, 2610::/23, 2620::/23, 2630::/12
LACNIC	16	2800::/12
RIPE	33	2003::/18, 2a00::/12, 2a10::/12



# In the wild

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- radar.qrator.net — 37
- bgp.tools — 35
  - <https://bgp.tools/table.json>
- diff
  - 2002::/16 (6to4)
  - 2400::/20 (AS4766 Korea Telecom) — not global

# In the wild



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2001::	Teredo	240b::	APNIC	2607::	ARIN	2a09::	RIPE
2002::	6to4	240c::	APNIC	2610::	ARIN	2a0b::	RIPE
2003::	RIPE	240d::	APNIC	2801::	LACNIC	2a0e::	RIPE
2403::	APNIC	240e::	APNIC	2802::	LACNIC	2a11::	RIPE
2404::	APNIC	240f::	APNIC	2804::	LACNIC	2a12::	RIPE
2406::	APNIC	2600::	ARIN	2806::	LACNIC	2a13::	RIPE
2407::	APNIC	2601::	ARIN	2a00::	RIPE	2a14::	RIPE
2408::	APNIC	2602::	ARIN	2a02::	RIPE	2c0e::	AFRINIC
2409::	APNIC	2605::	ARIN	2a03::	RIPE	2c0f::	AFRINIC

# By RIR



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	<b>RIR</b>	<b>LIR</b>	<b>GRT</b>	<b>Reply</b>	<b>Other</b>
<b>IANA</b>	2*	2*	2		1
<b>AFRINIC</b>	16	2	2		
<b>APNIC</b>	32	17	11	1	1
<b>ARIN</b>	34	15	6	1	1
<b>LACNIC</b>	16	5	4		
<b>RIPE</b>	33	22	11	2	6
total	133	63	36	4	9

# Reply



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<b>IP</b>	<b>RIR</b>	<b>CC</b>	<b>ASN</b>	<b>Name</b>	<b>Reply</b>
2409::	APNIC	IN	AS148000	Indian Public DNS	ICMP, DNS, HTTPS
2600::	ARIN	US	AS1239	Sprint / Cogent	ICMP, HTTP
2a09::	RIPE	EU	AS24013	xTom DE	ICMP, HTTP, DNS
2a11::	RIPE	EU	AS24013	xTom AU	ICMP, HTTP, DNS





# Destination unreachable

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```
$ ping -c4 2a03::  
PING 2a03::(2a03::) 56 data bytes  
From 2a00:1650::43 icmp_seq=1 Destination unreachable: Address unreachable  
From 2a00:1650::43 icmp_seq=2 Destination unreachable: Address unreachable  
From 2a00:1650::43 icmp_seq=3 Destination unreachable: Address unreachable  
From 2a00:1650::43 icmp_seq=4 Destination unreachable: Address unreachable  
  
--- 2a03:: ping statistics ---  
4 packets transmitted, 0 received, +4 errors, 100% packet loss, time 3093ms
```

# Prohibited



```
$ telnet 2a00:: 80
```

```
Trying 2a00::...
```

```
telnet: Unable to connect to remote host: Permission denied
```

```
$ tcpdump -nr 2a00.dump
```

```
09:12:14.657275 IP6 2001:1900:5:3::3fe > 2a06:3341:3e21::2a00:9780: ICMP6,  
destination unreachable, unreachable prohibited 2a00::, length 88
```



# Reply from another IP

---

```
$ ping -c4 2a14::  
PING 2a14::(2a14::) 56 data bytes  
64 bytes from 2a14:7:2161:76ff::2: icmp_seq=1 ttl=51 time=25.1 ms  
64 bytes from 2a14:7:2161:76ff::2: icmp_seq=2 ttl=51 time=20.8 ms  
64 bytes from 2a14:7:2161:76ff::2: icmp_seq=3 ttl=51 time=22.0 ms  
64 bytes from 2a14:7:2161:76ff::2: icmp_seq=4 ttl=51 time=20.2 ms  
  
--- 2a14:: ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3004ms  
rtt min/avg/max/mdev = 20.171/22.015/25.077/1.881 ms
```

# Loop



```
$ mtr -c 20 --report-wide 2a0b::
```

```
Start: 2025-05-14T16:10:54+0000
```

```
HOST: cesnet01.ring.nlnog.net      Loss%   Snt    Last    Avg    Best  Wrst  StDev
 1. |-- 2001:718:1:1f::253          0.0%    20     0.6    0.7    0.6    0.9    0.1
 2. |-- 2001:718:0:600:0:135:dc01:10 25.0%    20     0.7    0.8    0.6    1.4    0.2
 3. |-- nix1-ipv6.2connect.cz       0.0%    20     0.7    0.7    0.6    0.9    0.1
 4. |-- 2a00:1238:1238:814::1        0.0%    20     1.3    1.7    0.6    7.7    2.2
 5. |-- 2a00:1238:1238:205::2       95.0%    20     0.7    0.7    0.7    0.7    0.0
 6. |-- 2a0b:0:0:1::                 95.0%    20     0.8    0.8    0.8    0.8    0.0
 7. |-- 2a00:1238:1238:205::2       95.0%    20     0.8    0.8    0.8    0.8    0.0
 8. |-- 2a0b:0:0:1::                 95.0%    20     0.8    0.8    0.8    0.8    0.0
 9. |-- 2a00:1238:1238:205::2       95.0%    20     0.9    0.9    0.9    0.9    0.0
10. |-- 2a0b:0:0:1::                 95.0%    20     0.9    0.9    0.9    0.9    0.0
```

```
...
```

# Other



---

2002::	IANA	-	-	6to4	ICMP another IP
2003::	RIPE	DE	AS3320	DTAG	Prohibited (TCP 80, UDP 53)
240e::	APNIC	CN	AS4134	China Telecom	Prohibited (UDP 53)
2607::	ARIN	ID	AS19016	Westman Communications	Unreachable
2a00::	RIPE	DE	AS3209	Vodafone	Prohibited (TCP 80, UDP 53)
2a03::	RIPE	PT	AS204094	I4W	Unreachable
2a0b::	RIPE	CZ	AS41453	Sitel	Loop → Unreachable
2a12::	RIPE	NL	AS204790	Falco ISP Services	Reply ICMP, HTTP → no answer
2a14::	RIPE	DE	AS216176	Anikeen	ICMP from other IP



# Double luxury

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- AS24013 xTom
  - 2a09::
  - 2a11::
- AS2516 KDDI (JP)
  - 240b::
  - 240f::

We have **the shortest IPv6 address in the world.**  
Damn, we actually have **two of them.**



# Loops

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- RIPE90: [Amplification through IPv6 routing loops](#) [Maynard Koch]
- Czechia
  - 3, 4 place
- AS16019 Vodafone CZ
  - 3 place
- AS3214 xTom
  - 2 place

# Loops (by country)



## Scan 11-2024:

Country	Looping /48 subnets [#]
BRA	37,081,970
DEU	13,273,666
CZE	10,444,197
USA	7,613,551

## Scan 03-2025:

Country	Looping /48 subnets [#]
BRA	35,674,251
DEU	18,952,139
GBR	15,815,809
CZE	12,352,542



# Loops (by ASN)



AS-Number	Organization	Type	Looping /48 subnets [#]	$\Delta$ to first scan [#]
3170	VELOXSERV	Hosting	12,652,406	+12,652,400
3214	xTom GmbH	Hosting	7,864,367	+7,864,367
16019	VODAFONE-CZ-AS	ISP	5,291,388	+467,355

# Thank you

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