



Subnet Cheat Sheet

IPv4 prefixes, masks, wildcards and host counts

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Updated September 2026

Every IPv4 prefix

CIDR	Subnet mask	Wildcard	Addresses	Usable	
/8	255.0.0.0	0.255.255.255	16,777,216	16,777,214	10.0.0.0/8
/9	255.128.0.0	0.127.255.255	8,388,608	8,388,606	
/10	255.192.0.0	0.63.255.255	4,194,304	4,194,302	
/11	255.224.0.0	0.31.255.255	2,097,152	2,097,150	
/12	255.240.0.0	0.15.255.255	1,048,576	1,048,574	172.16.0.0/12
/13	255.248.0.0	0.7.255.255	524,288	524,286	
/14	255.252.0.0	0.3.255.255	262,144	262,142	
/15	255.254.0.0	0.1.255.255	131,072	131,070	
/16	255.255.0.0	0.0.255.255	65,536	65,534	192.168.0.0/16
/17	255.255.128.0	0.0.127.255	32,768	32,766	
/18	255.255.192.0	0.0.63.255	16,384	16,382	
/19	255.255.224.0	0.0.31.255	8,192	8,190	
/20	255.255.240.0	0.0.15.255	4,096	4,094	
/21	255.255.248.0	0.0.7.255	2,048	2,046	
/22	255.255.252.0	0.0.3.255	1,024	1,022	
/23	255.255.254.0	0.0.1.255	512	510	
/24	255.255.255.0	0.0.0.255	256	254	the default home network
/25	255.255.255.128	0.0.0.127	128	126	
/26	255.255.255.192	0.0.0.63	64	62	
/27	255.255.255.224	0.0.0.31	32	30	
/28	255.255.255.240	0.0.0.15	16	14	
/29	255.255.255.248	0.0.0.7	8	6	
/30	255.255.255.252	0.0.0.3	4	2	classic router link
/31	255.255.255.254	0.0.0.1	2	2	no broadcast, RFC 3021
/32	255.255.255.255	0.0.0.0	1	1	a single host

The two formulas

addresses = $2^{(32 - \text{prefix})}$ usable = $2^{(32 - \text{prefix})} - 2$ except /31 and /32

Sizing backwards: take the hosts you need, add two, round up to the next power of two.

Mask octet values

Decimal	Binary	Ones	Block
0	00000000	0	256
128	10000000	1	128
192	11000000	2	64
224	11100000	3	32
240	11110000	4	16
248	11111000	5	8
252	11111100	6	4
254	11111110	7	2
255	11111111	8	1

256 minus the value gives the block size, and boundaries are multiples of it.

Reserved and special-purpose

10.0.0.0/8	Private	RFC 1918. Businesses, data centers, VPNs
172.16.0.0/12	Private	RFC 1918. Common inside containers
192.168.0.0/16	Private	RFC 1918. Home routers
100.64.0.0/10	Carrier-grade NAT	RFC 6598. Shared provider address
127.0.0.0/8	Loopback	This machine. Never leaves it
169.254.0.0/16	Link-local	Self-assigned. Usually means DHCP failed
224.0.0.0/4	Multicast	One to many delivery
192.0.2.0/24	Documentation	RFC 5737. Safe in examples
198.51.100.0/24	Documentation	RFC 5737
203.0.113.0/24	Documentation	RFC 5737. Used throughout this site
0.0.0.0/0	Default route	Every address. Anywhere in a firewall rule

Common IPv6 prefixes

/48	An allocation to a site or organization
/56	A common residential allocation
/64	One network segment. The standard subnet size
/127	A point-to-point link, the IPv6 equivalent of /31
/128	A single host

A /31 has two usable addresses and no broadcast (RFC 3021). Most calculators get this wrong.

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