IPv6 CHEAT SHEET

IPv6 ADDRESS FORMAT

`2001:0db8:85a3:0000:0000:8a2e:0370:7334`
8 groups of 4 hexadecimal digits (0-9, A-F) separated by colons
128 bits total (16 bits per group)

IPv4 vs IPv6 COMPARISON

Feature	IPv4	IPv6
Address Length	32 bits	128 bits
Address Space	4.3 billion	340 undecillion
Notation	Decimal	Hexadecimal
Header Size	20-60 bytes	40 bytes (fixed)
Fragmentation	Router/Host	Host only
Checksum	Yes	No
Configuration	DHCP/Manual	Auto/DHCP/Manual
Security	Optional IPSec	Built-in IPSec

ADDRESS SHORTENING RULES

Original: 2001:0db8:0000:0000:0000:0000:0370:7334

Rule 1 - Remove Leading Zeros:
2001:db8:0:0:0:0:370:7334

Rule 2 - Compress Consecutive Zeros (::):
2001:db8::370:7334

Note: :: can only be used ONCE per address

More Examples:
`2001:db8:0:0:1:0:0:1` → `2001:db8::1:0:0:1`
`::1` = Loopback (127.0.0.1 in IPv4)
`::` = All zeros (0.0.0.0 in IPv4)

ADDRESS TYPES

Type	Prefix
Unicast	Various
Multicast	FF00::/8
Anycast	Same as Unicast
Link-Local	FE80::/10
Unique Local	FC00::/7
Global Unicast	2000::/3
Loopback	::1/128

SPECIAL ADDRESSES

Address	Purpose
::1	Loopback
::	Unspecified
FE80::/10	Link-Local
FF02::1	All Nodes
FF02::2	All Routers
2001:db8::/32	Documentation

PREFIX LENGTHS

Prefix	Purpose
/128	Host route
/64	Subnet (standard)
/56	Site allocation
/48	Organization
/32	ISP allocation