Network+ | 6.1. IPv4 Cheat Sheet

by Aelphi (Aelphi) via cheatography.com/179727/cs/37920/

Layers

@Layer2	btw 2 devices inside own NW or LAN
@Layer3	btw 2 NWs or 2 subnets

IPv4

Notation	dotted-decimal | 4x8bits = 32bits		
Subnet mask	defines NW proportion (1=NW, 0=host)		
Classes	ℹ classful mask = default subnet mask		
- Class **A**	**1-126**	255.0.0.0	/8
- Class **B**	**128-191**	255.255.0.0	/16
- Class **C**	**192-223**	255.255.255.0	/24
- Class D	224-239	n/a	n/a

IP Types

- Routable	Public IPs purchased and used by ISP		
- Private	non routable		
	A	10.0.0.0/8	10.255.255.255/8
	B	172.16.0.0/16	172.31.255.255/16
	C	192.168.0.0/24	192.168.255.255/24
- Specialized	127.x.x.x	loopback adress for local testing	
- Automatic	*APIPA*	assigned by OS if DHCP u/s	
- Virtual	VIP(A)	not correlating to any NIC	
	ex @L7: loadbalancer, failover		
	ex @L3: HSRP *(Hot StandBy Routing Prot.)*		

IPv4 Data flows

Unicast	single destination
Multicast	multi-specific destination
Broadcast	all devices on a network

Assignment

Static	simple, time-consuming, prone to error, hard to setup in large scale
Dynamic	quick, easy, scalable
Content	IP adress, subnet mask, default GW, DNS server (or WINS)
TTL	time for which an IP is leased to a host. After, IP is given back to IP pool
APIPA	IP self-assigned in case of DHCP unavailable, from the network **169.254.0.0**/16
ZeroConf	idem but more recent, using mDNS and DNS-SD

Subnet masks and available IPs

Dotted-Decimal Notation	CIDR	Binary Notation
255.0.0.0	/8	11111111.00000000.00000000.00000000
255.255.0.0	/16	11111111.11111111.00000000.00000000
255.255.255.0	/24	11111111.11111111.11111111.00000000
255.255.255.128	/25	11111111.11111111.11111111.10000000
255.255.255.192	/26	11111111.11111111.11111111.11000000
255.255.255.224	/27	11111111.11111111.11111111.11100000
255.255.255.240	/28	11111111.11111111.11111111.11110000
255.255.255.248	/29	11111111.11111111.11111111.11111000
255.255.255.252	/30	11111111.11111111.11111111.11111100
3 network bits : 2^3 = 8 subnets		5 hots bits : 2^5-2 = 32-2 = 30 av. IPs

Subnetting

Purpose	scaling NW according to its scope of use, to control bandwidth
How	borrow bits from original host portion and add them to the NW portion

Calculation

IP	10.	**180.**	122.	244	/13
Mask	255.	**248.**	0.	0	
*256-**248** = **8** hots/subnet | 180%**8** = **4** | 180-**4** = **176***					
Subnet	10.	**176.**	0.	0	
ϟ *the next subnet is 176+**8**=184*					
Brdcst	10.	**183.**	255.	255	
1st IP	10.	176.	**0.**	**1**	
Last IP	10.	183.	**255.**	**254**	