Subnetizare

Subnetizarea este procesul de a sparge o retea in doua sau mai multe retele (sau subretele). Un subnet este o sub-divizare logica a unui IP.

Subretea este o tehnica care le permite administratorilor de retea sa utilizeze mai eficient cei 32 de biti disponibili intr-o adresa IP prin crearea de retele care nu se limiteaza la adresele IP de clasa A, B și C. Cu subretele, puteti crea retele cu limite de gazda mai realiste.

Subretele ofera o modalitate mai flexibila de a desemna partea unei adrese IP compusa din ID-ul retelei si o portiune reprezinta ID-ul gazdei. Cu clasele standard de adrese IP, exista doar trei dimensiuni posibile de ID de retea: 8 biti pentru Clasa A, 16 biti pentru Clasa B și 24 de biti pentru Clasa C. Subreteaua va permite sa selectati un numar arbitrar de biti utilizati pentru ID-ul retelei.

Chiar daca o singura organizatie are mii de dispozitive de retea, operarea tuturor acestor dispozitive cu acelasi ID de retea ar incetini reteaua. Modul in care functioneaza TCP/IP impune ca toate computerele cu acelasi ID de retea sa fie in aceeasi retea fizica. Reteaua fizica cuprinde un singur domeniu de difuzare, ceea ce inseamnă ca un singur mediu de retea trebuie sa transporte tot traficul pentru retea. Din motive de performanta, retelele sunt de obicei segmentate in domenii de difuzare care sunt mai mici decat ofera chiar si adresele de clasa C.

Subnetizarea reduce congestia retelei si creste performantele.

Sa luam ca exmplu reteaua 192.168.88.0/24 care cuprinde toate gazdele intre 1-254 si putem sa o spargem in subretele cum urmeaza:

Subnet	1	2	4	8	16	32	64	128	156
Host	256	128	64	32	16	8	4	2	1
Subnet Mask	/24	/25	/26	/27	/28	/29	/30	/31	/32

Tabel subnet /24

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.254	192.168.88.255
192.168.88.128	192.168.88.129 - 192.168.88.254	192.168.88.255

Tabel subnet /25

Network Address	Usable Host Range	Broadcast Address:

192.168.88.0	192.168.88.1 - 192.168.88.126	192.168.88.127
192.168.88.128	192.168.88.129 - 192.168.88.254	192.168.88.255

Tabel subnet /26

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.62	192.168.88.63
192.168.88.64	192.168.88.65 - 192.168.88.126	192.168.88.127
192.168.88.128	192.168.88.129 - 192.168.88.190	192.168.88.191
192.168.88.192	192.168.88.193 - 192.168.88.254	192.168.88.255

Tabel subnet /27

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.30	192.168.88.31
192.168.88.32	192.168.88.33 - 192.168.88.62	192.168.88.63
192.168.88.64	192.168.88.65 - 192.168.88.94	192.168.88.95
192.168.88.96	192.168.88.97 - 192.168.88.126	192.168.88.127
192.168.88.128	192.168.88.129 - 192.168.88.158	192.168.88.159
192.168.88.160	192.168.88.161 - 192.168.88.190	192.168.88.191
192.168.88.192	192.168.88.193 - 192.168.88.222	192.168.88.223
192.168.88.224	192.168.88.225 - 192.168.88.254	192.168.88.255

Tabel subnet /28

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.14	192.168.88.15
192.168.88.16	192.168.88.17 - 192.168.88.30	192.168.88.31
192.168.88.32	192.168.88.33 - 192.168.88.46	192.168.88.47
192.168.88.48	192.168.88.49 - 192.168.88.62	192.168.88.63
192.168.88.64	192.168.88.65 - 192.168.88.78	192.168.88.79
192.168.88.80	192.168.88.81 - 192.168.88.94	192.168.88.95
192.168.88.96	192.168.88.97 - 192.168.88.110	192.168.88.111
192.168.88.112	192.168.88.113 - 192.168.88.126	192.168.88.127

Tabel subnet /29

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.6	192.168.88.7
192.168.88.8	192.168.88.9 - 192.168.88.14	192.168.88.15
192.168.88.16	192.168.88.17 - 192.168.88.22	192.168.88.23
192.168.88.24	192.168.88.25 - 192.168.88.30	192.168.88.31
192.168.88.32	192.168.88.33 - 192.168.88.38	192.168.88.39
192.168.88.40	192.168.88.41 - 192.168.88.46	192.168.88.47
192.168.88.48	192.168.88.49 - 192.168.88.54	192.168.88.55
192.168.88.56	192.168.88.57 - 192.168.88.62	192.168.88.63
192.168.88.64	192.168.88.65 - 192.168.88.70	192.168.88.71
192.168.88.72	192.168.88.73 - 192.168.88.78	192.168.88.79
192.168.88.80	192.168.88.81 - 192.168.88.86	192.168.88.87
192.168.88.88	192.168.88.89 - 192.168.88.94	192.168.88.95

Tabel subnet /30

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.2	192.168.88.3
192.168.88.4	192.168.88.5 - 192.168.88.6	192.168.88.7
192.168.88.8	192.168.88.9 - 192.168.88.10	192.168.88.11
192.168.88.12	192.168.88.13 - 192.168.88.14	192.168.88.15
192.168.88.16	192.168.88.17 - 192.168.88.18	192.168.88.19
192.168.88.20	192.168.88.21 - 192.168.88.22	192.168.88.23
192.168.88.24	192.168.88.25 - 192.168.88.26	192.168.88.27
192.168.88.28	192.168.88.29 - 192.168.88.30	192.168.88.31
192.168.88.32	192.168.88.33 - 192.168.88.34	192.168.88.35
192.168.88.36	192.168.88.37 - 192.168.88.38	192.168.88.39
192.168.88.40	192.168.88.41 - 192.168.88.42	192.168.88.43
192.168.88.44	192.168.88.45 - 192.168.88.46	192.168.88.47

Tabel subnet /31

Network Address	Usable Host Range	Broadcast Address:
192.168.88.0	192.168.88.1 - 192.168.88.0	192.168.88.1
192.168.88.2	192.168.88.3 - 192.168.88.2	192.168.88.3
192.168.88.4	192.168.88.5 - 192.168.88.4	192.168.88.5
192.168.88.6	192.168.88.7 - 192.168.88.6	192.168.88.7
192.168.88.8	192.168.88.9 - 192.168.88.8	192.168.88.9
192.168.88.10	192.168.88.11 - 192.168.88.10	192.168.88.11
192.168.88.12	192.168.88.13 - 192.168.88.12	192.168.88.13
192.168.88.14	192.168.88.15 - 192.168.88.14	192.168.88.15

Forma generala a unei adrese IP este network prefix + host number. In cazul subnetizarii vom avea netork prefix + subnet number + host number.

Retele intotdeauna incep cu un numar par si se termina cu un numar impar. Primul numar din subnet este network id iar ultimul numar, cel impar este broadcast id.

Subnet mask-ul va arata network id-ul pentru fiecare subretea, pentru ca aceasta sa mearga trebuie sa ii spunem routerului ce portiune a retelei vom folosi.