

Conversion table (octet)

DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN	DEC	HEX	BIN
0	00	00000000	43	2B	00101011	86	56	01010110	128	80	10000000	171	AB	10101011	214	D6	11010110
1	01	00000001	44	2C	00101100	87	57	01010111	129	81	10000001	172	AC	10101100	215	D7	11010111
2	02	00000010	45	2D	00101101	88	58	01011000	130	82	10000010	173	AD	10101101	216	D8	11011000
3	03	00000011	46	2E	00101110	89	59	01011001	131	83	10000011	174	AE	10101110	217	D9	11011001
4	04	00000100	47	2F	00101111	90	5A	01011010	132	84	10000100	175	AF	10101111	218	DA	11011010
5	05	00000101	48	30	00110000	91	5B	01011011	133	85	10000101	176	B0	10110000	219	DB	11011011
6	06	00000110	49	31	00110001	92	5C	01011100	134	86	10000110	177	B1	10110001	220	DC	11011100
7	07	00000111	50	32	00110010	93	5D	01011101	135	87	10000111	178	B2	10110010	221	DD	11011101
8	08	00001000	51	33	00110011	94	5E	01011110	136	88	10001000	179	B3	10110011	222	DE	11011110
9	09	00001001	52	34	00110100	95	5F	01011111	137	89	10001001	180	B4	10110100	223	DF	11011111
10	0A	00001010	53	35	00110101	96	60	01100000	138	8A	10001010	181	B5	10110101	224	E0	11100000
11	0B	00001011	54	36	00110110	97	61	01100001	139	8B	10001011	182	B6	10110110	225	E1	11100001
12	0C	00001100	55	37	00110111	98	62	01100010	140	8C	10001100	183	B7	10110111	226	E2	11100010
13	0D	00001101	56	38	00111000	99	63	01100011	141	8D	10001101	184	B8	10111000	227	E3	11100011
14	0E	00001110	57	39	00111001	100	64	01100100	142	8E	10001110	185	B9	10111001	228	E4	11100100
15	0F	00001111	58	3A	00111010	101	65	01100101	143	8F	10001111	186	BA	10111010	229	E5	11100101
16	10	00010000	59	3B	00111011	102	66	01100110	144	90	10010000	187	BB	10111011	230	E6	11100110
17	11	00010001	60	3C	00111100	103	67	01100111	145	91	10010001	188	BC	10111100	231	E7	11100111
18	12	00010010	61	3D	00111101	104	68	01101000	146	92	10010010	189	BD	10111101	232	E8	11101000
19	13	00010011	62	3E	00111110	105	69	01101001	147	93	10010011	190	BE	10111110	233	E9	11101001
20	14	00010100	63	3F	00111111	106	6A	01101010	148	94	10010100	191	BF	10111111	234	EA	11101010
21	15	00010101	64	40	01000000	107	6B	01101011	149	95	10010101	192	C0	11000000	235	EB	11101011
22	16	00010110	65	41	01000001	108	6C	01101100	150	96	10010110	193	C1	11000001	236	EC	11101100
23	17	00010111	66	42	01000010	109	6D	01101101	151	97	10010111	194	C2	11000010	237	ED	11101101
24	18	00011000	67	43	01000011	110	6E	01101110	152	98	10011000	195	C3	11000011	238	EE	11101110
25	19	00011001	68	44	01000100	111	6F	01101111	153	99	10011001	196	C4	11000100	239	EF	11101111
26	1A	00011010	69	45	01000101	112	70	01110000	154	9A	10011010	197	C5	11000101	240	F0	11110000
27	1B	00011011	70	46	01000110	113	71	01110001	155	9B	10011011	198	C6	11000110	241	F1	11110001
28	1C	00011100	71	47	01000111	114	72	01110010	156	9C	10011100	199	C7	11000111	242	F2	11110010
29	1D	00011101	72	48	01001000	115	73	01110011	157	9D	10011101	200	C8	11001000	243	F3	11110011
30	1E	00011110	73	49	01001001	116	74	01110100	158	9E	10011110	201	C9	11001001	244	F4	11110100
31	1F	00011111	74	4A	01001010	117	75	01110101	159	9F	10011111	202	CA	11001010	245	F5	11110101
32	20	00100000	75	4B	01001011	118	76	01110110	160	A0	10100000	203	CB	11001011	246	F6	11110110
33	21	00100001	76	4C	01001100	119	77	01110111	161	A1	10100001	204	CC	11001100	247	F7	11110111
34	22	00100010	77	4D	01001101	120	78	01111000	162	A2	10100010	205	CD	11001101	248	F8	11111000
35	23	00100011	78	4E	01001110	121	79	01111001	163	A3	10100011	206	CE	11001110	249	F9	11111001
36	24	00100100	79	4F	01001111	122	7A	01111010	164	A4	10100100	207	CF	11001111	250	FA	11111010
37	25	00100101	80	50	01010000	123	7B	01111011	165	A5	10100101	208	D0	11010000	251	FB	11111011
38	26	00100110	81	51	01010001	124	7C	01111100	166	A6	10100110	209	D1	11010001	252	FC	11111100
39	27	00100111	82	52	01010010	125	7D	01111101	167	A7	10100111	210	D2	11010010	253	FD	11111101
40	28	00101000	83	53	01010011	126	7E	01111110	168	A8	10101000	211	D3	11010011	254	FE	11111110
41	29	00101001	84	54	01010100	127	7F	01111111	169	A9	10101001	212	D4	11010100	255	FF	11111111
42	2A	00101010	85	55	01010101				170	AA	10101010	213	D5	11010101			

Decomposition table

subnetmask (CIDR)	/24		/25		/26		/27		/28		/29		/30	
subnetmask (DEC)	0		.128		.192		.224		.240		.248		.252	
subnetmask (HEX)	.00		.80		.C0		.E0		.F0		.F8		.FC	
	0	255	0	127	0	63	0	31	0	15	0	7	0	3
													4	7
											8	15	8	11
													12	15
									16	31	16	23	16	19
													20	23
											24	31	24	27
													28	31
						32	63	32	47	32	39	32	35	
													36	39
											40	47	40	43
													44	47
								48	63	48	55	48	51	
													52	55
											56	63	56	59
													60	63
				64	127	64	95	64	79	64	71	64	67	
													68	71
											72	79	72	75
													76	79
								80	95	80	87	80	83	
													84	87
										88	95	88	91	
													92	95
					96	127	96	111	96	103	96	99		
													100	103
											104	111	104	107
													108	111
								112	127	112	119	112	115	
													116	119
										120	127	120	123	
													124	127

		128	255	128	191	128	159	128	143	128	135	128	131	
													132	135
											136	143	136	139
													140	143
									144	159	144	151	144	147
													148	151
											152	159	152	155
													156	159
						160	191	160	175	160	167	160	163	
													164	167
											168	175	168	171
													172	175
									176	191	176	183	176	179
													180	183
											184	191	184	187
													188	191
					192	255	192	223	192	207	192	199	192	195
													196	199
											200	207	200	203
													204	207
									208	223	208	215	208	211
													212	215
											216	223	216	219
													220	223
						224	255	224	239	224	231	224	227	
													228	231
											232	239	232	235
													236	239
									240	255	240	247	240	243
													244	247
											248	255	248	251
													252	255

How to use decomposition table - decomposing /28 subnet

- **Use:** determine host address ranges per subnet
- Subnet address range depends on the granularity:
 - /28 has 2^3 addresses
 - decomposes into 2 /29 subnets with 2^2 addresses
 - decomposes into 4 /30 subnets with 2^1 addresses
- **Recipe:**
 1. Determine how many addresses you need
 2. Find smallest available subnet available in table

e.g. 157.16.1.0/28

/28		/29		/30	
.240		.248		.252	
.F0		.F8		.FC	
0	15	0	7	0	3
				4	7
		8	15	8	11
				12	15

most significant

bit 3

bit 2

bit 1

bit 0

least significant

