

SUBNET INFORMATION SHEET 2		Comments or Corrections		Marv Erlandson, Wheaton High School		1700 3rd Av So		Wheaton, MN 56296		e-mail		mre@wheaton.k12.mn.us		12/3/97											
FORMULAS		N = # BITS BORROWED FROM HOST PORTION						M = # BITS REMAINING IN HOST PORTION																	
Class A License		N + M = 24		OR N = 24 - M		OR M = 24 - N		CLASS A 1ST OCTET NUMBER RANGE 0 <--> 127**																	
Class B License		N + M = 16		OR N = 16 - M		OR M = 16 - N		CLASS B 1ST OCTET NUMBER RANGE 128 <--> 191																	
Class C License		N + M = 8		OR N = 8 - M		OR M = 8 - N		CLASS C 1ST OCTET NUMBER RANGE 192 <--> 223																	
Theoretical # Subnets		2^N						**127 RESERVED FOR LOOPBACK AND INTERNAL TESTING																	
Actual # Subnets		$2^N - 2$																							
Theoretical # Hosts		2^M						OR-> (256 #Octets in Host Portion) / #Theoretical Subnets																	
Actual # Hosts/Subnet		$2^M - 2$						OR-> [(256 #Octets in Host Portion) / #Theoretical Subnets] - 2																	
Power of 2		2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
Number Value of Bin#		128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1
BIN. ADD Left -> Right			192	224	240	248	252	254	255		192	224	240	248	252	254	255		192	224	240	248	252	254	255
Subnet Mask		128	192	224	240	248	252	254	255	128	192	224	240	248	252	254	255	128	192	224	240	248	252	254	255
CLASS A LICENSE						CLASS B LICENSE																			
# Bits	Subnet	Theoretical	Theoretical	Actual	Actual	# Bits	Subnet	Theoretical	Theoretical	Actual	Actual														
Borrowed	Mask	#Subnets	#Hosts/Sub	#Subnets	#Hosts/Sub	Borrowed	Mask	#Subnets	#Hosts/Sub	#Subnets	#Hosts/Sub														
2	255.192.0.0	4	4,194,304	2	4,194,302	2	255.255.192.0	4	16,384	2	16,382														
3	255.224.0.0	8	2,097,152	6	2,097,150	3	255.255.224.0	8	8,192	6	8,190														
4	255.240.0.0	16	1,048,576	14	1,048,574	4	255.255.240.0	16	4,096	14	4,094														
5	255.248.0.0	32	524,288	30	524,286	5	255.255.248.0	32	2,048	30	2,046														
6	255.252.0.0	64	262,144	62	262,142	6	255.255.252.0	64	1,024	62	1,022														
7	255.254.0.0	128	131,072	126	131,070	7	255.255.254.0	128	512	126	510														
8	255.255.0.0	256	65,536	254	65,534	8	255.255.255.0	256	256	254	254														
9	255.255.128.0	512	32,768	510	32,766	9	255.255.255.128	512	128	510	126														
10	255.255.192.0	1,024	16,384	1,022	16,382	10	255.255.255.192	1,024	64	1,022	62														
11	255.255.224.0	2,048	8,192	2,046	8,190	11	255.255.255.224	2,048	32	2,046	30														
12	255.255.240.0	4,096	4,096	4,094	4,094	12	255.255.255.240	4,096	16	4,094	14														
13	255.255.248.0	8,192	2,048	8,190	2,046	13	255.255.255.248	8,192	8	8,190	6														
14	255.255.252.0	16,384	1,024	16,382	1,022	14	255.255.255.252	16,384	4	16,382	2														
15	255.255.254.0	32,768	512	32,766	510	CLASS C LICENSE																			
16	255.255.255.0	65,536	256	65,534	254	# Bits	Subnet	Theoretical	Theoretical	Actual	Actual														
17	255.255.255.128	131,072	128	131,070	126	Borrowed	Mask	#Subnets	#Hosts/Sub	#Subnets	#Hosts/Sub														
18	255.255.255.192	262,144	64	262,142	62	2	255.255.255.192	4	64	2	62														
19	255.255.255.224	524,288	32	524,286	30	3	255.255.255.224	8	32	6	30														
20	255.255.255.240	1,048,576	16	1,048,574	14	4	255.255.255.240	16	16	14	14														
21	255.255.255.248	2,097,152	8	2,097,150	6	5	255.255.255.248	32	8	30	6														
22	255.255.255.252	4,194,304	4	4,194,302	2	6	255.255.255.252	64	4	62	2														

THESE TWO BITS CAN NOT BE BORROWED