

1.

92	11	D8	2D	73	7B	83	EE	17	C5	B7	5D	08	00	45	33
00	72	13	D5	69	73	8B	1A	61	50	7A	5E	D9	33	93	06
AC	D8	39	E1	CC	DD	D9	21	7A	B9	FC	84	2D	77	EC	F2
8F	44	87	9D	78	2A	20	29	C0	4D	F6	79	33	D2	B6	1A
62	74	3B	D4	F6	2E	DF	8C	37	15	56	9C	2A	36	8C	51
B4	25	5F	A4	53	B2	C1	26	82	6E	06	93	0A	E2	56	AC
C2	44	5B	DB	5C	CC	4A	A2	A2	2E	B4	B3	4D	1B	3E	BE
A0	99	D0	2C	1C	65	A4	B8	EA	88	3D	25	5F	5C	9A	33

Destination Hardware Address	92	11	D8	2D	73	7B				10010010	00010001	11011000	00101101	01110011	01111011
Source Hardware Address	83	EE	17	C5	B7	5D				10000011	11101110	00010111	11000101	10110111	01011101
Frame Type	08	00								00001000	00000000				
Vers & Len	45									01000101					
Type Of Service	33									00110011					
Total Length	00	72								00000000	01110010				
Ident	13	D5								00010011	11010101				
Flags & Fragment Offset	69	73								01101001	01110011				
Flags	Don't Fragment		More Fragments												
Fragment Offset	09	73								00001001	01110011				
TTL	8B									10001011					
Type	1A									00011010					
Header Checksum	61	50								01100001	01010000				
Source IP Address	7A	5E	D9	33						01111010	01011110	11011001	00110011		
Class	A														
Network	7A									01111010					
Host	5E	D9	33							01011110	11011001	00110011			
Source IP Address (Decimal)	122	94	217	51											
Destination IP Address	93	06	AC	D8						10010011	00000110	10101100	11011000		
Class	B														
Network	93	06								10010011	00000110				
Host	AC	D8								10101100	11011000				
Destination IP Address (Decimal)	147	6	172	216											
Source Port	39	E1								00111001	11100001				
Destination Port	CC	DD								11001100	11011101				
Sequence Number	D9	21	7A	B9						11011001	00100001	01111010	10111001		
Acknowledgement Number	FC	84	2D	77						11111100	10000100	00101101	01110111		
Data Offset & Reserved & Flags	EC	F2								11101100	11110010				
Data Offset	E										1110				
Reserved	6										110				
Flags			CWR	ECE	URG	ACK									
Window Size	8F	44								10001111	01000100				
Checksum	87	9D								10000111	10011101				
Urgent Pointer	78	2A								01111000	00101010				
Payload Data	20	29	C0	4D	F6					00100000	00101001	11000000	01001101	11110110	

2.

Version 1

#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx
1	A/T0 – D/T0 & E/T0	7	E/T2 – C/T0	13		19	
2	C/T0 – E/T1	8	B/T2 – C/T1	14		20	
3	E/T2 – D/T1 & A/T0	9		15		21	
4	B/T0 – A/T1	10		16		22	
5	A/T2 – B/T0	11		17		23	
6	C/T0 – B/T1	12		18		24	

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T 0	10.0.0.0	0	Direct							10.0.0.0	0	Direct	10.0.0.0	0	Direct
	20.0.0.0	0	Direct	20.0.0.0	0	Direct									
				30.0.0.0	0	Direct	30.0.0.0	0	Direct						
							40.0.0.0	0	Direct						
										50.0.0.0	0	Direct	50.0.0.0	0	Direct

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T 1	10.0.0.0	0	Direct	10.0.0.0	1	20.0.0.1	10.0.0.0	1	40.0.0.5	10.0.0.0	0	Direct	10.0.0.0	0	Direct
	20.0.0.0	0	Direct	20.0.0.0	0	Direct	20.0.0.0	2	40.0.0.5	20.0.0.0	1	10.0.0.1	20.0.0.0	1	10.0.0.1
	30.0.0.0	2	10.0.0.5	30.0.0.0	0	Direct	30.0.0.0	0	Direct						
	40.0.0.0	1	10.0.0.5	40.0.0.0	2	20.0.0.1	40.0.0.0	0	Direct				40.0.0.0	0	Direct
	50.0.0.0	1	10.0.0.5	50.0.0.0	2	20.0.0.1	50.0.0.0	1	40.0.0.5	50.0.0.0	0	Direct	50.0.0.0	0	Direct

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T 2	10.0.0.0	0	Direct	10.0.0.0	1	20.0.0.1	10.0.0.0	1	40.0.0.5	10.0.0.0	0	Direct	10.0.0.0	0	Direct
	20.0.0.0	0	Direct	20.0.0.0	0	Direct	20.0.0.0	1	30.0.0.2	20.0.0.0	1	10.0.0.1	20.0.0.0	1	10.0.0.1
	30.0.0.0	1	20.0.0.2	30.0.0.0	0	Direct	30.0.0.0	0	Direct	30.0.0.0	2	10.0.0.5	30.0.0.0	1	40.0.0.3
	40.0.0.0	1	10.0.0.5	40.0.0.0	1	30.0.0.3	40.0.0.0	0	Direct	40.0.0.0	1	10.0.0.5	40.0.0.0	0	Direct
	50.0.0.0	1	10.0.0.5	50.0.0.0	2	20.0.0.1	50.0.0.0	1	40.0.0.5	50.0.0.0	0	Direct	50.0.0.0	0	Direct

3.

a	13			
b	2,046			
c	255	255	248	0
	11111111	11111111	11111000	00000000
d	123	237	47	145
	01111011	11101101	00101111	10010001

4.

IP Address	187	211	229	189
	10111011	11010011	11100101	10111101
Subnet Mask	255	255	240	0
	11111111	11111111	11110000	00000000
a	Network	48,083		
b	Subnet	14		
c	Host	1,469		

1.

18	56	B4	6D	CB	A8	C6	60	48	92	F3	62	08	00	45	CB
00	72	03	84	70	F1	6A	6B	76	08	07	57	AB	35	D4	6D
6E	9B	76	2F	98	07	7C	96	15	32	7C	9A	D7	38	B9	F0
77	76	E7	1B	C9	D6	A1	3E	0F	61	AF	33	BD	47	F0	2F
82	C6	C0	59	3C	CE	38	20	D1	19	D2	DD	1F	69	F7	91
85	49	3E	8E	F9	AF	06	91	23	BB	5D	7B	E1	A2	0F	D2
3D	BB	61	38	B1	28	9C	7D	AB	2E	20	24	98	79	B7	83
51	C1	C6	8B	74	EC	E1	77	E2	41	96	CD	8F	25	33	EF

Destination Hardware Address	18	56	B4	6D	CB	A8														00011000	01010110	10110100	01101101	11001011	10101000	
Source Hardware Address	C6	60	48	92	F3	62															11000110	01100000	01001000	10010010	11110011	01100010
Frame Type	08	00																			00001000	00000000				
Vers & Len		45																			01000101					
Type Of Service		CB																			11001011					
Total Length		00	72																		00000000	01110010				
Ident		03	84																		00000011	10000100				
Flags & Fragment Offset		70	F1																		01110000	11110001				
Flags		Don't Fragment		More Fragments																						
Fragment Offset		10	F1																		00010000	11110001				
TTL		6A																			01101010					
Type		6B																			01101011					
Header Checksum		76	08																		01110110	00001000				
Source IP Address		07	57	AB	35																00000111	01010111	10101011	00110101		
Class		A																								
Network		07																			00000111					
Host		57	AB	35																	01010111	10101011	00110101			
Source IP Address (Decimal)		7	87	171	53																					
Destination IP Address		D4	6D	6E	9B																11010100	01101101	01101110	10011011		
Class		C																								
Network		D4	6D	6E																	11010100	01101101	01101110			
Host		9B																			10011011					
Destination IP Address (Decimal)		212	109	110	155																					
Source Port		76	2F																		01110110	00101111				
Destination Port		98	07																		10011000	00000111				
Sequence Number		7C	96	15	32																01111100	10010110	00010101	00110010		
Acknowledgement Number		7C	9A	D7	38																01111100	10011010	11010111	00111000		
Data Offset & Reserved & Flags		B9	F0																		10111001	11110000				
Data Offset		B																				1011				
Reserved		4																				100				
Flags		NS	CWR	ECE	URG	ACK																				
Window Size		77	76																		01110111	01110110				
Checksum		E7	1B																		11100111	00011011				
Urgent Pointer		C9	D6																		11001001	11010110				
Payload Data		A1	3E	0F	61	AF															10100001	00111110	00001111	01100001	10101111	

2.

Version 2

#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx	#	From Router/Tx – To Router/Tx
1	E/T0 – A/T0 & D/T0	7	D/T2 – C/T0	13		19	
2	C/T0 – D/T1	8	B/T2 – C/T1	14		20	
3	D/T2 – E/T0 & A/T1	9		15		21	
4	B/T0 – E/T1	10		16		22	
5	E/T2 – B/T0	11		17		23	
6	C/T0 – B/T1	12		18		24	

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T0	10.0.0.0	0	Direct							10.0.0.0	0	Direct	10.0.0.0	0	Direct
				20.0.0.0	0	Direct	20.0.0.0	0	Direct						
							30.0.0.0	0	Direct	30.0.0.0	0	Direct			
				40.0.0.0	0	Direct							40.0.0.0	0	Direct
	50.0.0.0	0	Direct							50.0.0.0	0	Direct			

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T1	10.0.0.0	0	Direct	10.0.0.0	1	40.0.0.5	10.0.0.0	1	30.0.0.4	10.0.0.0	0	Direct	10.0.0.0	0	Direct
				20.0.0.0	0	Direct	20.0.0.0	0	Direct				20.0.0.0	2	10.0.0.4
				30.0.0.0	2	40.0.0.5	30.0.0.0	0	Direct	30.0.0.0	0	Direct	30.0.0.0	1	10.0.0.4
	40.0.0.0	1	10.0.0.5	40.0.0.0	0	Direct	40.0.0.0	2	30.0.0.4	40.0.0.0	1	10.0.0.5	40.0.0.0	0	Direct
	50.0.0.0	0	Direct	50.0.0.0	2	40.0.0.5	50.0.0.0	1	30.0.0.4	50.0.0.0	0	Direct	50.0.0.0	1	10.0.0.4

	A			B			C			D			E		
	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route	Network	Hops	Route
T2	10.0.0.0	0	Direct	10.0.0.0	1	40.0.0.5	10.0.0.0	1	30.0.0.4	10.0.0.0	0	Direct	10.0.0.0	0	Direct
	20.0.0.0	2	10.0.0.4	20.0.0.0	0	Direct	20.0.0.0	0	Direct	20.0.0.0	1	30.0.0.3	20.0.0.0	1	40.0.0.2
	30.0.0.0	1	10.0.0.4	30.0.0.0	1	20.0.0.3	30.0.0.0	0	Direct	30.0.0.0	0	Direct	30.0.0.0	1	10.0.0.4
	40.0.0.0	1	10.0.0.5	40.0.0.0	0	Direct	40.0.0.0	1	20.0.0.2	40.0.0.0	1	10.0.0.5	40.0.0.0	0	Direct
	50.0.0.0	0	Direct	50.0.0.0	2	40.0.0.5	50.0.0.0	1	30.0.0.4	50.0.0.0	0	Direct	50.0.0.0	1	10.0.0.4

3.

a	13			
b	2,046			
c	255	255	248	0
	11111111	11111111	11111000	00000000
d	115	241	63	107
	01110011	11110001	00111111	01101011

4.

IP Address	181	235	229	241
	10110101	11101011	11100101	11110001
Subnet Mask	255	255	240	0
	11111111	11111111	11110000	00000000
a	Network	46,571		
b	Subnet	14		
c	Host	1,521		