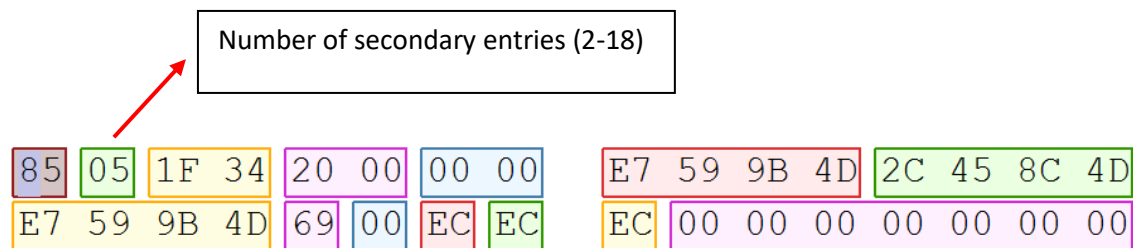


85	05	1F	34	20	00	00	00	E7	59	9B	4D	2C	45	8C	4D	...	4	çY>M, EEM
E7	59	9B	4D	69	00	EC	EC	EC	00	00	00	00	00	00	00	çY>Mi ììì		
C0	03	00	33	A7	C0	00	00	D0	AD	0A	00	00	00	00	00	À 3\$À Ð-		
00	00	00	00	EB	01	00	00	D0	AD	0A	00	00	00	00	00	ë Ð-		
C1	00	44	00	4D	00	34	00	5F	00	4F	00	63	00	74	00	Á D M 4 _ O c t		
61	00	6C	00	61	00	6E	00	64	00	48	00	65	00	78	00	a l a n d H e x		
C1	00	61	00	64	00	65	00	63	00	69	00	6D	00	61	00	Á a d e c i m a		
6C	00	4E	00	75	00	6D	00	62	00	65	00	72	00	53	00	l N u m b e r s		
C1	00	79	00	73	00	74	00	65	00	6D	00	73	00	5F	00	Á y s t e m s _		
42	00	50	00	5F	00	39	00	5F	00	32	00	32	00	5F	00	B P _ 9 _ 2 2 _		
C1	00	31	00	34	00	2E	00	70	00	64	00	66	00	00	00	Á 1 4 . p d f		
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00			

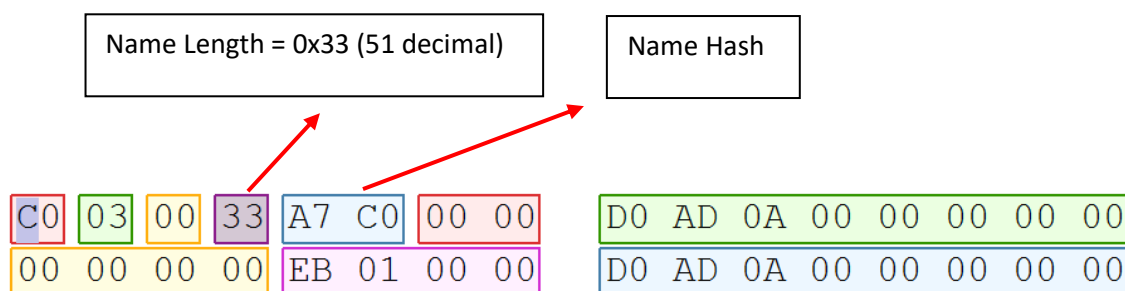
File Directory Entry:



(ref: <https://docs.microsoft.com/en-us/windows/win32/fileio/exfat-specification> section. 6.4)

Secondary entries:

Name length field in the **Stream Extension** Entry:



Is the length of the Unicode string of the subsequent File Name directory entries the subsequent File Name directory entries collectively contain. Valid range of values for this field are 1 to 255.

(ref: <https://docs.microsoft.com/en-us/windows/win32/fileio/exfat-specification> section.7.6.3)

Name Length x 2 (each Unicode field is 2 bytes long) = 51 * 2 = 102 bytes

Filename bytes:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	UTF-16							
44	00	4D	00	34	00	5F	00	4F	00	63	00	74	00	61	00	D	M	4	_	O	c	t	a
6C	00	61	00	6E	00	64	00	48	00	65	00	78	00	61	00	l	a	n	d	H	e	x	a
64	00	65	00	63	00	69	00	6D	00	61	00	6C	00	4E	00	d	e	c	i	m	a	l	N
75	00	6D	00	62	00	65	00	72	00	53	00	79	00	73	00	u	m	b	e	r	S	y	s
74	00	65	00	6D	00	73	00	5F	00	42	00	50	00	5F	00	t	e	m	s	_	B	P	_
39	00	5F	00	32	00	32	00	5F	00	31	00	34	00	2E	00	9	_	2	2	_	1	4	.
70	00	64	00	66	00											p	d	f					

Size: 102

File Name Entries:

C1	00	44	00	4D	00	34	00	5F	00	4F	00	63	00	74	00
61	00	6C	00	61	00	6E	00	64	00	48	00	65	00	78	00
C1	00	61	00	64	00	65	00	63	00	69	00	6D	00	61	00
6C	00	4E	00	75	00	6D	00	62	00	65	00	72	00	53	00
C1	00	79	00	73	00	74	00	65	00	6D	00	73	00	5F	00
42	00	50	00	5F	00	39	00	5F	00	32	00	32	00	5F	00
C1	00	31	00	34	00	2E	00	70	00	64	00	66	00	00	00
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

File NameHash:

“The NameHash field shall contain a 2-byte hash of the up-cased file name”. In other words, it is the 2-byte hash of the Capitalized filename. It is calculated as follows:

Initial values of Hash = 0

NumberOfBytes = (the Name Length value of the stream extension field) * 2

The Hash is the SUM of the following iteration which starts from 0 to (the value of NumberOfBytes - 1) or in plain English, for each byte of the filename:

(If the current hash value is an odd integer, 32768 is added) + (the right binary shift of the Hash value) + the (decimal (integer) value of the current byte of the filename).

A right binary shift loses the least-significant bit and inserts a 0 on the other end. For example, the right binary shift of 110011 is 011001, so 33 becomes 25.

So, the NameHash of "DM4_OctalandHexadecimalNumberSystems_BP_9_22_14.pdf" is in fact the NameHash of: 'DM4_OCTALANDHEXADECIMALNUMBERSYSTEMS_BP_9_22_14.PDF' and is: A7C0.

(ref: <https://docs.microsoft.com/en-us/windows/win32/fileio/exfat-specification> section.7.6.4)

Sample PowerShell script to get the NameHash of a filename:

https://raw.githubusercontent.com/kacos2000/Other/master/ExFat/ExFat_Name_Hash.ps1

Example for filename "Filename.docx" (NameHash = 0xF437 in Little Endian)

Filename.docx (hexadecimal):

0x 46-00-49-00-4C-00-45-00-4E-00-41-00-4D-00-45-00-2E-00-44-00-4F-00-43-00-58-00

byte	byte value	Hash is odd	Hash value	Hash Binary value	Hash Binary right shift 1 Decimal	Hash Binary right shift 1	New Hash	New Hash (hex)
0x46	70		0	0000000000000000	0	0000000000000000	70	46
0x00	0		70	000000001000110	35	000000000100011	35	23
0x49	73	Add 32768	35	000000000100011	17	000000000010001	32.858	805A
0x00	0		32.858	1000000001011010	16.429	010000000101101	16.429	402D
0x4C	76	Add 32768	16.429	010000000101101	8.214	0010000000010110	41.058	A062
0x00	0		41.058	1010000001100010	20.529	0101000000110001	20.529	5031
0x45	69	Add 32768	20.529	0101000000110001	10.264	0010100000011000	43.101	A85D
0x00	0	Add 32768	43.101	1010100001011101	21.550	0101010000101110	54.318	D42E
0x4E	78		54.318	1101010000101110	27.159	0110101000010111	27.237	6A65
0x00	0	Add 32768	27.237	0110101001100101	13.618	0011010100110010	46.386	B532
0x41	65		46.386	1011010100110010	23.193	0101101010011001	23.258	5ADA
0x00	0		23.258	0101101011011010	11.629	0010110101101101	11.629	2D6D
0x4D	77	Add 32768	11.629	0010110101101101	5.814	0001011010110110	38.659	9703
0x00	0	Add 32768	38.659	1001011100000011	19.329	0100101110000001	52.097	CB81
0x45	69	Add 32768	52.097	1100101110000001	26.048	0110010111000000	58.885	E605
0x00	0	Add 32768	58.885	1110011000000101	29.442	0111001100000010	62.210	F302
0x2E	46		62.210	1111001100000010	31.105	0111100110000001	31.151	79AF
0x00	0	Add 32768	31.151	0111100110101111	15.575	0011110011010111	48.343	BCD7
0x44	68	Add 32768	48.343	1011110011010111	24.171	0101111001101011	57.007	DEAF
0x00	0	Add 32768	57.007	1101111010101111	28.503	0110111101010111	61.271	EF57
0x4F	79	Add 32768	61.271	1110111101010111	30.635	0111011110101011	63.482	F7FA
0x00	0		63.482	1111011111111010	31.741	0111101111111101	31.741	7BFD
0x43	67	Add 32768	31.741	0111101111111101	15.870	0011110111111110	48.705	BE41
0x00	0	Add 32768	48.705	1011111001000001	24.352	0101111100100000	57.120	DF20
0x58	88		57.120	1101111100100000	28.560	0110111110010000	28.648	6FE8
0x00	0		28.648	0110111111101000	14.324	0011011111110100	14.324	37F4