

## Appendix C

### Vertices in 4D-OPP's defined in terms of Manifold and Non-Manifold Edges and Their Corresponding 4D Configurations

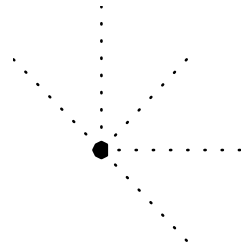
We will describe and classify these vertices in 4D-OPP's depending on the number of Manifold and Non-Manifold edges incident to them. In the nomenclature to use “V” means vertex, the first digit shows the number of incident Manifold edges, the “N” followed by a digit is present if there are incident Non-Manifold edges to the vertex and the digit indicates the number of such edges, and a third digit is included to distinguish between two different types that otherwise could receive the same name. In each vertex continuous lines indicate Manifold edges and dotted lines indicate Non-Manifold edges.

•  
V0

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
0	1	16	253
4	13	12	241
8	109 132		

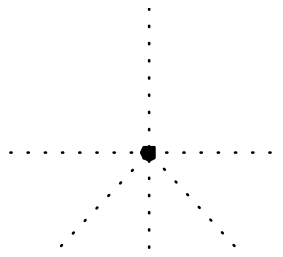
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V0N2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	17 26	12	231
6	62 66	10	198
8	120 144		



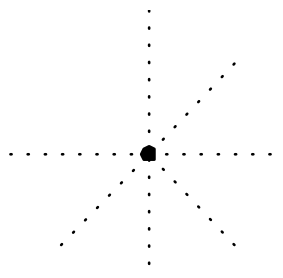
**V0N5**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
7	105	9	147



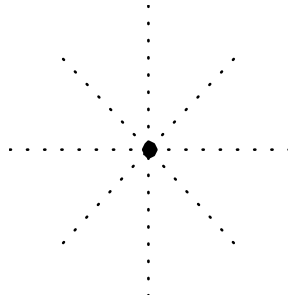
**V0N6**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
5	42	10	197
8	141		
	143		



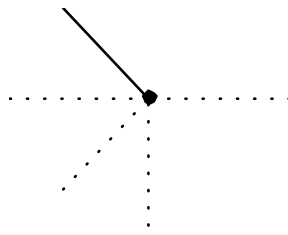
**V0N7**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
4	18	12	230
5	43	11	209
6	64	10	180
	72		184
	76		
7	106	9	149
8	125		



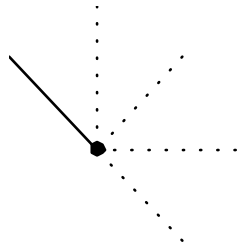
**V0N8**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
4	27 28	12	226 227
5	45 47 48	11	206 207 210
6	70 75 77 78	10	176 177 178 179 185
7	102 104 108	9	146 148 152
8	134 139 145		



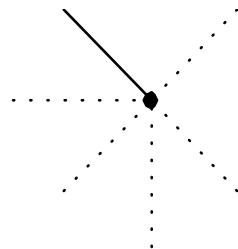
**V1N4**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
5	35



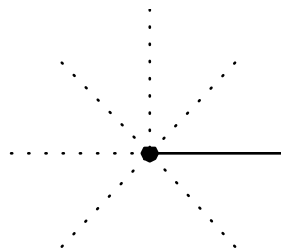
V1N4-2

Number of surrounding Hyper-boxes	Corresponding Configurations
9	156



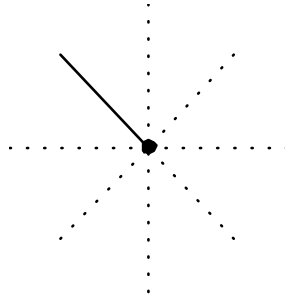
V1N5

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	25	12	232
6	65		



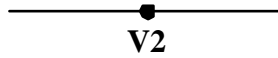
V1N6

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
7	107	9	150
			164



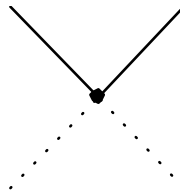
V1N7

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	21	12	228
5	36 39	11	208 211
6	71 73	10	182 183 188
7	95 97 103	9	154 157
8	133 135 137		



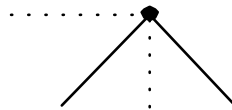
V2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
2	3	14	251
6	49	10	205
8	116		



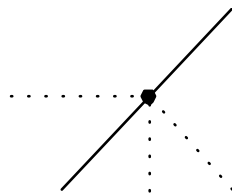
V2N2

Number of surrounding Hyper-boxes	Corresponding Configurations
4	24



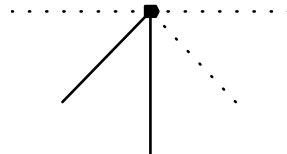
V2N2-2

Number of surrounding Hyper-boxes	Corresponding Configurations
9	163
11	224



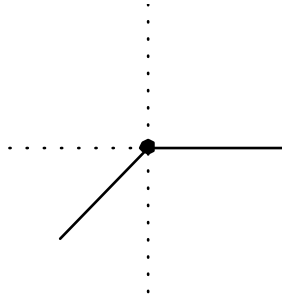
V2N3

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	16	12	238
8	113		
	131		



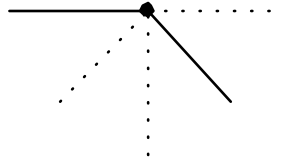
V2N3-2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
5	44	11	212
7	89		



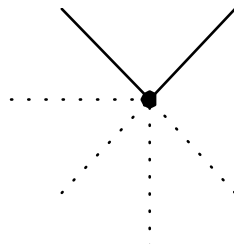
V2N3-3

Number of surrounding Hyper-boxes	Corresponding Configurations
6	63



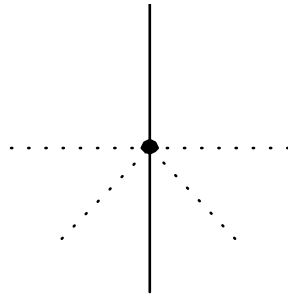
V2N3-4

Number of surrounding Hyper-boxes	Corresponding Configurations
9	172



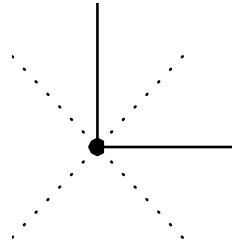
V2N4

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
5	33	11	217
6	53		
7	87		
	98		
8	119		



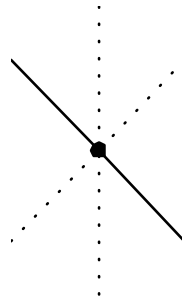
V2N4-2

Number of surrounding Hyper-boxes	Corresponding Configurations
6	67



V2N4-3

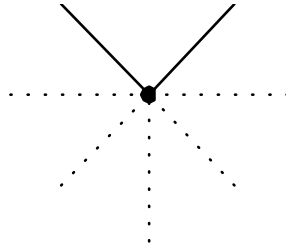
Number of surrounding Hyper-boxes	Corresponding Configurations
8	136



V2N4-4

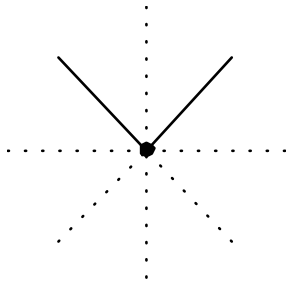
Number of surrounding Hyper-boxes	Corresponding Configurations
8	142





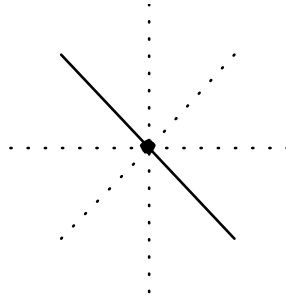
V2N5

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	20	12	233
5	41	11	215
7	88 91	9	160
8	138		



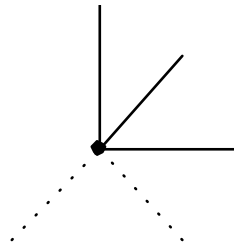
V2N6

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	23	12	229
5	46	11	213 214 216
6	69	10	187 190
7	94 96	9	151 159 161 162
8	130		



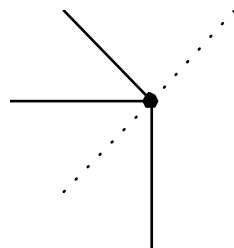
**V2N6-2**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
8	140



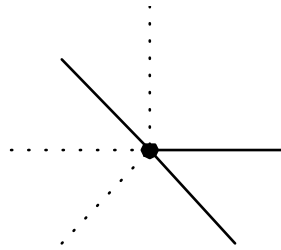
**V3N2**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
3	9	13	246
5	30		
7	90		



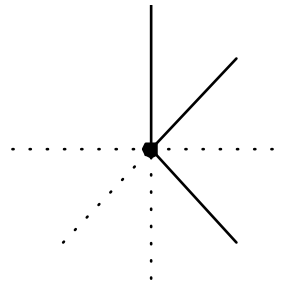
**V3N2-2**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
5	40



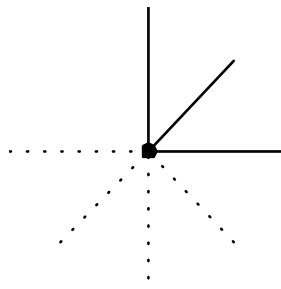
V3N3

Number of surrounding Hyper-boxes	Corresponding Configurations
10	200



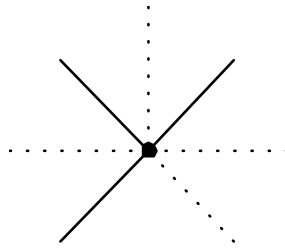
V3N4

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
6	68	10	186
8	126 127	9	158



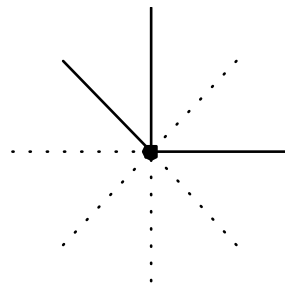
V3N4-2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
3	8	13	244
4	19	12	234
5	31	11	223
7	86	9	165 169
8	114 115		



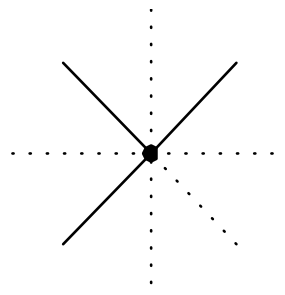
**V3N4-3**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
7	99



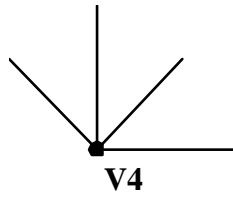
**V3N5**

<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
6	54	10	189
	58		194
8	122	9	155
	124		

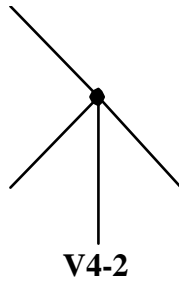


**V3N5-2**

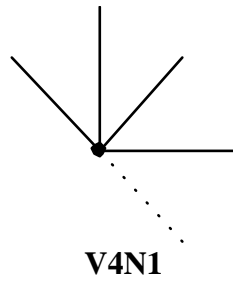
<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>	<b>Number of surrounding Hyper-boxes</b>	<b>Corresponding Configurations</b>
7	100	9	153



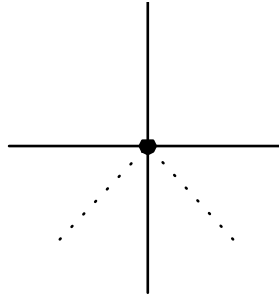
Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
1	2	15	252
3	7	13	247
5	29	11	225
7	79	9	175



Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
6	59	10	201

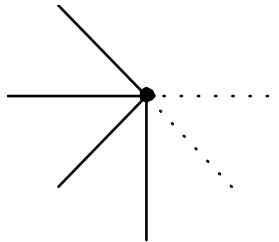


Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
3	11	13	245



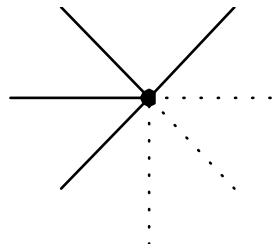
V4N2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
2	4	14	250
6	50	12	235
		10	204



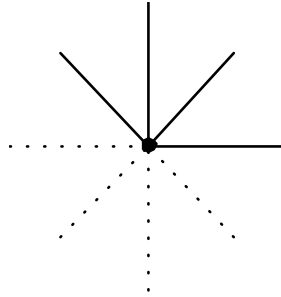
V4N2-2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
6	52	10	192



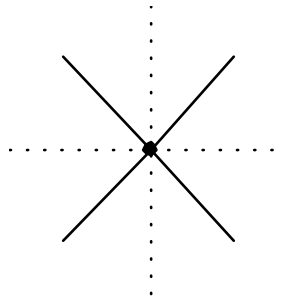
V4N3

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
5	34	11	218
7	92	10	199



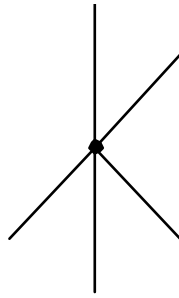
V4N4

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
3	10	13	242
	12		243
6	56	10	191
	61		193
			195
			196
7	82	9	166
			168



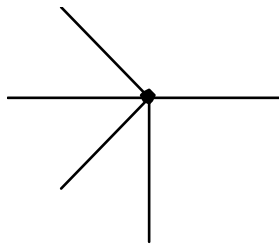
V4N4-2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
6	74	10	181
7	93		
8	121		
	123		



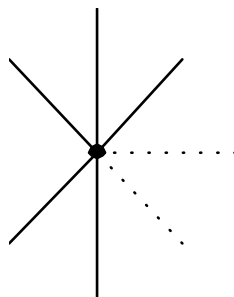
V5

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	15	12	239



V5-2

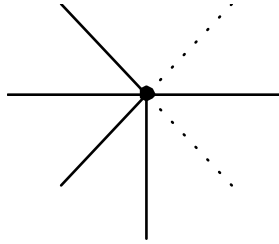
Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
7	80	9	173
	84		174



V5N2

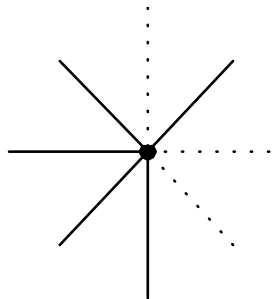
Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	22	12	236
8	117		





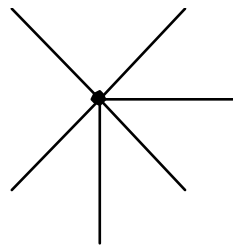
V5N2-2

Number of surrounding Hyper-boxes	Corresponding Configurations
6	57 60



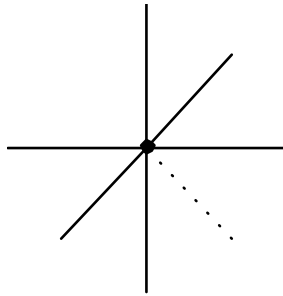
V5N3

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
5	37	11	219 220
8	128		



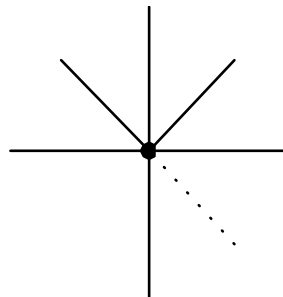
V6

Number of surrounding Hyper-boxes	Corresponding Configurations
5	38
8	112



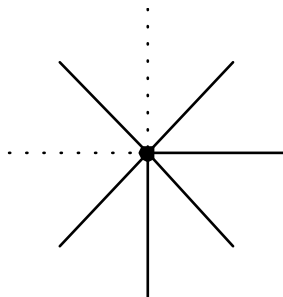
V6N1

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
2	5	14	249
6	51		
8	118		



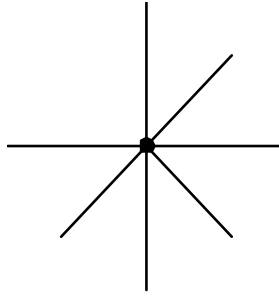
V6N1-2

Number of surrounding Hyper-boxes	Corresponding Configurations
9	167



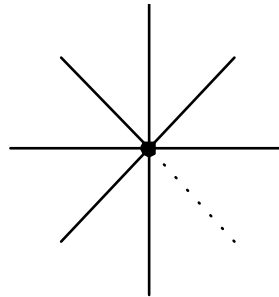
V6N2

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
7	81 83 101	12	237
8	129	9	170 171



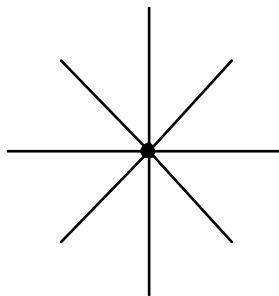
V7

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
4	14	12	240
8	111	11	221
		10	203



V7N1

Number of surrounding Hyper-boxes	Corresponding Configurations
7	85



V8

Number of surrounding Hyper-boxes	Corresponding Configurations	Number of surrounding Hyper-boxes	Corresponding Configurations
2	6	14	248
5	32	11	222
6	55	10	202
8	110		