RAID Layouts Reference

1	Data block
P	XOR parity
Q	Reed-Solomon parity
S	Hot spare

No redundancy

RAID0

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

JBOD

1	5	8
2	6	9
3	7	10
4		11
		12

also known as *span*

Mirror-based arrays

RAID1

1	1
2	2
3	3

Mirror

RAID1

1	1	1
2	2	2
3	3	3

Three-way mirror

RAID10

1	2	3	1	2	3
4	5	6	4	5	6
7	8	9	7	8	9

Same as RAID 1+0 or 0+1

RAID1E

1	1	2	2	3
3	4	4	5	5
6	6	7	7	8
8	9	9	10	10

Near

RAID1E

1	2	3	4	5
5	1	2	3	4
6	7	8	9	10
10	6	7	8	9

Interleaved

RAID1E

1	2	3	4	5
6	7	8	9	10
…	…	…	…	…
5	1	2	3	4
10	6	7	8	9

Far

Parity-based single disk redundancy

Traditional RAID5 layouts

RAID5

1	2	3	P
5	6	P	4
9	P	7	8
P	10	11	12

Left symmetric

RAID5

P	1	2	3
6	P	4	5
8	9	P	7
10	11	12	P

Right symmetric

RAID5

1	2	3	P
4	5	P	6
7	P	8	9
P	10	11	12

Left asymmetric

RAID5

P	1	2	3
4	P	5	6
7	8	P	9
10	11	12	P

Right asymmetric

RAID4

1	2	3	P
4	5	6	P
7	8	9	P
10	11	12	P

With dedicated parity disk

RAID5

		P
		P
		P
	P	
	P	
	P	
P		
P		
P		

Delayed parity
(HP SmartArray controllers)

Integrated hot spare

RAID5E

1	2	3	P
4	5	P	6
7	P	8	-
S	S	S	S

Spare blocks at the end

RAID5EE

1	2	P	S
3	P	S	4
P	S	5	6
S	7	8	P

Distributed spare blocks

Dual disk redundancy based on Reed-Solomon

RAID6

Q			P
		P	Q
	P	Q	
P	Q		

Left P-top

RAID6

P			Q
		Q	P
	Q	P	
Q	P		

Left Q-top

RAID6

Q	1	2	P
3	4	P	Q
6	P	Q	5
P	Q	7	8

Left P-top symmetric

RAID6

Q	1	2	P
3	4	P	Q
5	P	Q	6
P	Q	7	8

Left P-top asymmetric

RAID6

Q_{12}	1	2	P_{12Q}
3	4	P_{34Q}	Q_{34}
6	P_{56Q}	Q_{56}	5
P_{78Q}	Q_{78}	7	8

Left P-top symmetric 12QP

RAID6

Q_{12P}	1	2	P_{12}
3	4	P_{34}	Q_{34P}
6	P_{56}	Q_{56P}	5
P_{78}	Q_{78P}	7	8

Left P-top symmetric 12PQ