

??Stripe size

	??0	??1	??2	??3
??0	D0	D1	D2	P0
??1	D3	D4	P1	D5
??2	D6	P2	D7	D8
??3	P3	D9	D10	D11
??4	D12	D13	D14	P4

?raid card???stirpe size

?? 64 Kbytes = 128 Sectors

??????RAID?????Host-CPU?????....

????????I/O request?????CPU?????...

???, ??????????:

SSD; Max I/O Read Test, QD64

Intel ICH10R Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	912.20843	456.104215	70.157377	81.221897	28679077888	54701	259923033	57891.77105	59.49593
16K	1001.953685	500.976842	63.873142	78.45644	31499223040	60080	251073129	32427.8501	69.071535
32K	1038.815443	519.407721	61.606554	77.112258	32658423808	62291	246771532	21562.98427	94.206423
64K	1072.24724	536.12362	59.683713	78.235179	33711718400	64300	250365057	9652.520362	127.544912
128K	1086.034252	543.017126	58.928025	81.755146	34144780288	65126	261629482	5652.841009	228.85997

LSI LSI SAS2108 RAID Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	1146.140631	573.070316	55.838198	63.82506	36040081408	68741	204248424	5175.503077	637.596191
16K	1278.927798	639.463899	50.041008	65.227	40216559616	76707	208734812	5521.545665	727.960762
32K	1359.614309	679.807154	47.070353	53.780523	42760404992	81559	172104771	5947.819469	680.782058
64K	1349.655887	674.827943	47.418062	60.459029	42446356480	80960	193476691	5921.335828	650.493825
128K	1384.479395	692.239697	46.225029	56.706609	43543166976	83052	181468461	4543.451799	670.997572

SSD; Max Throughput Read Test, QD64

Intel ICH10R Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	7304.850919	456.553182	8.76089	24.559365	28730982400	438400	78593886	56306.61498	575.572441
16K	8016.106388	501.006649	7.983261	24.047344	31529762816	481106	76955337	32200.22965	764.717725
32K	8405.622343	525.351396	7.613432	27.535301	33059438592	504447	88117358	17622.94577	1054.552147
64K	8596.960791	537.310049	7.443949	25.508482	33813889024	515959	81631213	9389.244932	1117.951232
128K	8701.390832	543.836927	7.354637	25.314621	34225848320	522245	81010816	4777.942741	1259.347309

LSI LSI SAS2108 RAID Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	8967.166057	560.447879	7.136753	40.279738	35281108992	538347	128900355	10411.27939	1769.663224
16K	9540.186511	596.261657	6.708113	16.760037	37531156480	572680	53634280	10230.01619	2800.689597
32K	10439.60141	652.475088	6.130117	13.728152	41064988672	626602	43931856	11096.45624	2917.33117
64K	10600.99917	662.562448	6.036596	14.860921	41704161280	636355	47556864	7236.844183	2819.440273
128K	10578.27337	661.142086	6.049508	18.687557	41613918208	634978	59802591	9359.130888	2637.701236

SSD; 4K; 100% read; 100% random, QD64

Intel ICH10R Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	86357.37516	337.333497	0.74092	10.187381	21229735936	5183041	32601246	73645.5781	4358.480663
16K	86909.40615	339.489868	0.73621	13.101273	21366136832	5216342	41926164	74005.73209	4431.627457
32K	86856.65157	339.283795	0.736657	19.772207	21352685568	5213058	63274218	73836.81961	4415.829032
64K	86916.87813	339.519055	0.736148	19.486752	21367795712	5216747	62360715	73878.75848	4460.994081
128K	86824.44085	339.157972	0.736917	18.826557	21345546240	5211315	60247980	73882.652	4373.479967

LSI LSI SAS2108 RAID Controller									
Stripe Size	IOPS	MB/s	Avg. Read Response Time	Max. Read Response Time	Bytes Read	Read I/Os	Max. Raw Read Response Time	Interrupts/s	CPU Effectiveness
8K	115233.3686	450.130346	0.555208	8.78888	28331257856	6916811	28125549	70344.33888	10080.12864
16K	115354.5926	450.603877	0.554628	12.945762	28360409088	6923928	41428107	70423.33168	10150.90065
32K	115110.4717	449.65028	0.555804	15.41628	28295639040	6908115	49334085	70372.06151	9550.983513
64K	115340.307	450.548074	0.554694	8.524802	28355878912	6922822	27280467	70341.88759	10203.93436
128K	115333.2301	450.52043	0.55473	8.336423	28357926912	6923322	26677629	70285.80783	10140.42443

????????, Driver-based RAID??,????RAID????????Host CPU??, ???Stripping, ?????????CPU?I/O????????I/O???
?. ??SSD; Max I/O Read Test??...

?????8KB??, ?????????,???I/O????, ?????Host-CPU????8KB????/?????Disk, ?????, I/O????????, ?????8KB
?????????5???, ?????IOP-based RAID, ?LSISAS2108??built-in processor????????, ?????????RAID chip?
?built-in processor??, ???, Host CPU???I/O?????????????????. ?????8KB????, Driver-based RAID?IOP-based
RAID?????10???, ???IOP-based RAID????????.

???Driver-based RAID??, Response Time????, ?I/O????????, ?I/O???, ???128KB??, ??Response Time??
30ms??, Avg. Response Time??10ms??, ?????IOP-based RAID??Hardware RAID????I/O???

CPU Effectiveness????I/O????CPU????, ?I/O????kernel??,?I/O????????????(Device Driver), ?????????
????????. ???????????:

CPU Effectiveness= IOPS / CPU Utilization

????????????????I/O??, ?????IOPS??, CPU????(????CPU?), ?????????, ?????????Hardware RAID????????
??Driver-based RAID. ??, ICH10R???3Gb/s, ???6Gb/s????????????, ?????6Gb/s????????I/O??.