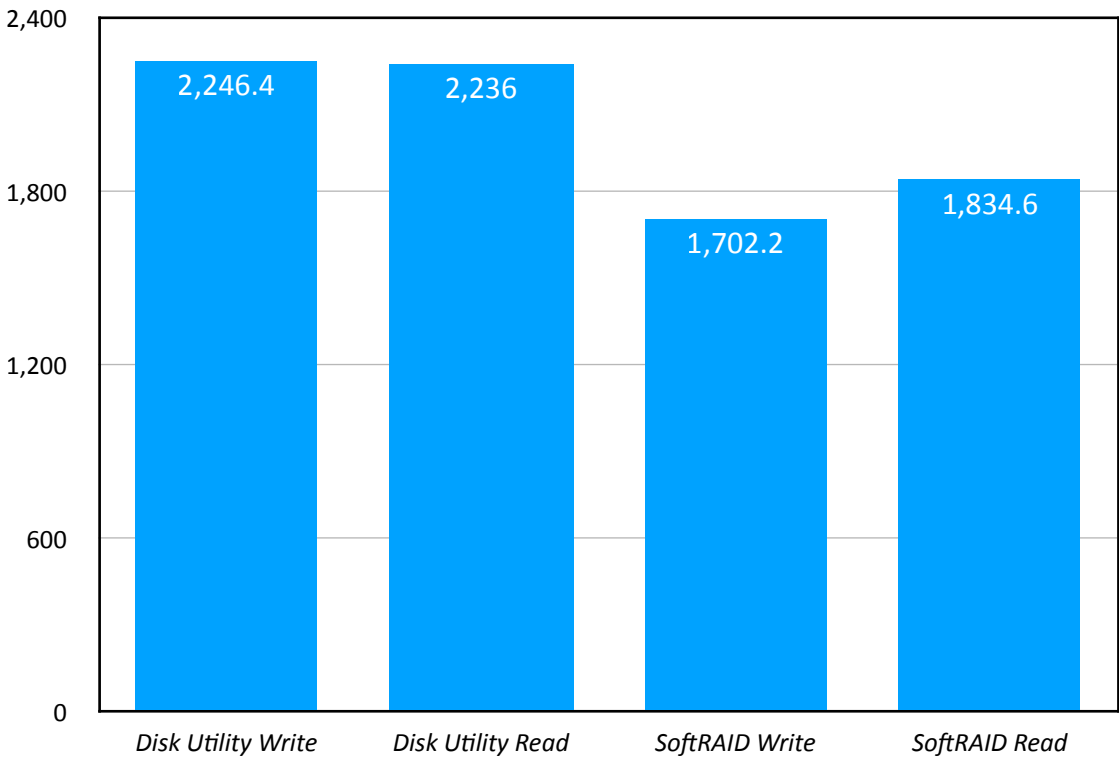**Compare: RAID 0 Speeds Based on Formatting Software**

| | Theoretical Speeds | | Blackmagic Disk Speed Test v. 3.4.2 | | | | Blackmagic Disk Speed Test DISK UTILITY IS FASTER BY | | AJA System Test (Full) v. 16.2.2.5 | | | | AJA System Test (Full) DISK UTILITY IS FASTER BY | | AJA System Test (Lite) v. 12.4.3 | | | | AJA System Test (Lite) DISK UTILITY IS FASTER BY | |
| | | | Format: Disk Utility | | Format: SoftRAID | | | | Format: Disk Utility | | Format: SoftRAID | | | | Format: Disk Utility | | Format: SoftRAID | | | |
	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write %	Read %	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write %	Read %	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write %	Read %
Average	**2,850**	**2,850**	**2,799**	**2,270**	**2,833**	**1,787**	**-1.2%**	**27.0%**	**2,246**	**2,236**	**1,702**	**1,835**	**32.0%**	**21.9%**	**1,564**	**1,675**	**1,587**	**1,677**	**-1.5%**	**-0.1%**
Maximum			2,815	2,291	2,839	1,879			2,257	2,242	1,831	1,922			1,570	1,678	1,648	1,719		
Minimum			2,767	2,243	2,817	1,641			2,235	2,230	1,648	1,792			1,559	1,670	1,546	1,642		
St. Dev.			19	22	9	90			8	5	73	50			4	3	53	37		
Test 1			2,806	2,290	2,836	1,641			2,235	2,234	1,831	1,922			1,570	1,678	1,546	1,653		
Test 2			2,804	2,291	2,835	1,835			2,257	2,234	1,648	1,792			1,563	1,678	1,643	1,716		
Test 3			2,815	2,276	2,839	1,879			2,245	2,240	1,672	1,818			1,559	1,670	1,550	1,642		
Test 4			2,802	2,251	2,838	1,782			2,249	2,242	1,685	1,824			1,562	1,676	1,648	1,719		
Test 5			2,767	2,243	2,817	1,799			2,246	2,230	1,675	1,817			1,564	1,674	1,548	1,656		

NOTES:
* Test computer: 16" MacBook Pro (M1 Pro SoC) 32 GB RAM
* macOS Monterey (12.6.1)
* Test storage: OWC Thunderblade (8 TB) connected via Thunderbolt 4.
* BMB (v. 12.3.4) test file: 5 GB (maximum allowed)
* AJA test file (both versions): UHD, 16 GB ProRes 422 (maximum allowed)
* First test results for all software always ignored, because they were higher than any other test.
* Lower standard deviation (St. Dev.) numbers indicate more consistent results.

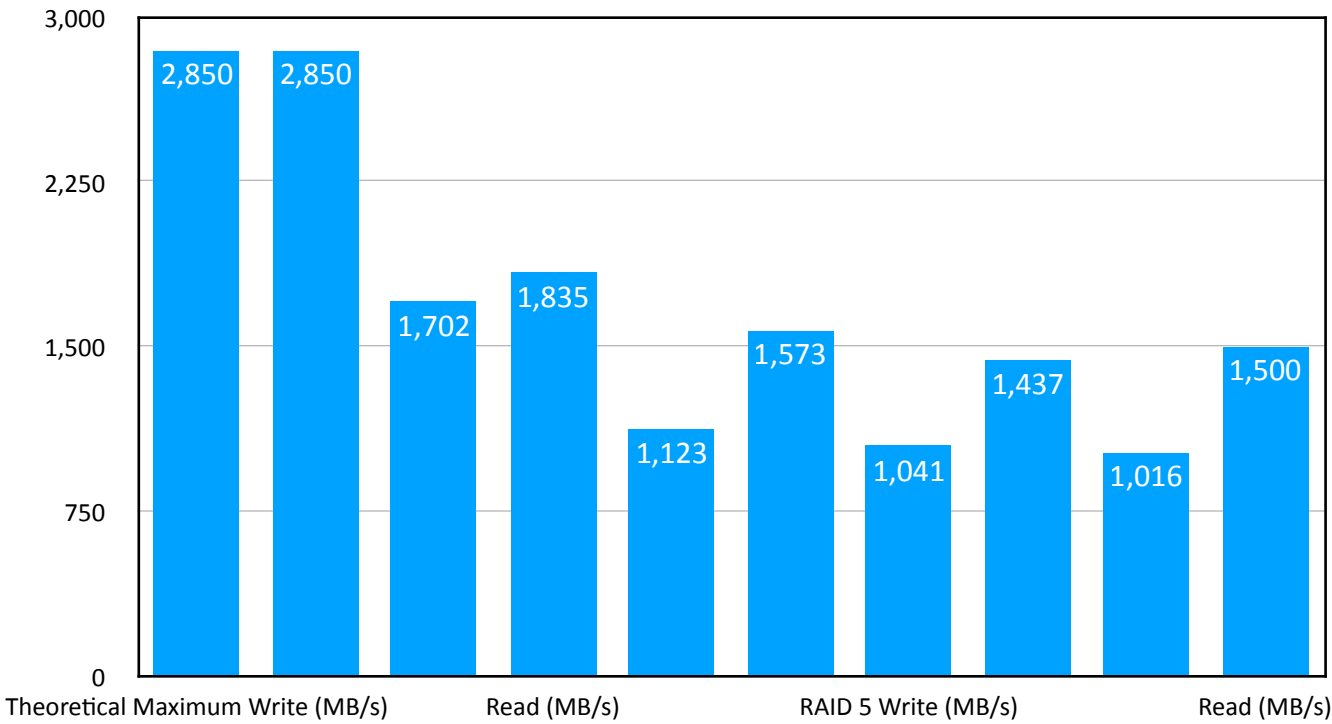**Compare RAID 0 Speeds Based on Formatting Software**

Average of five tests measured in MB/s using AJA System Test (full version).

Comparing Speeds by RAID Type - Formatted Using SoftRAID

	Theoretical Maximum		RAID 0		RAID 4		RAID 5		RAID 1+0		RAID 0 compared to Expectations		RAID 4 compared to Expectations		RAID 5 compared to Expectations		RAID 1+0 compared to 2 GB/s Expectations	
	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write %	Read %	Write %	Read %	Write %	Read %	Write %	Read %
Average	**2,850**	**2,850**	**1,702**	**1,835**	**1,123**	**1,573**	**1,041**	**1,437**	**1,016**	**1,500**	**-67.4%**	**-55.3%**	**-153.9%**	**-81.2%**	**-173.9%**	**-98.3%**	**-49.2%**	**-25.0%**
Maximum			1,831	1,922	1,137	1,584	1,057	1,449	1,018	1,508								
Minimum			1,648	1,792	1,116	1,566	1,003	1,427	1,011	1,492								
St. Dev.			73	50	9	7	22	10	3	6								
Test 1			1,831	1,922	1,121	1,584	1,055	1,432	1,011	1,492								
Test 2			1,648	1,792	1,116	1,576	1,047	1,430	1,016	1,508								
Test 3			1,672	1,818	1,137	1,566	1,057	1,427	1,018	1,501								
Test 4			1,685	1,824	1,123	1,570	1,041	1,449	1,017	1,498								
Test 5			1,675	1,817	1,116	1,568	1,003	1,448	1,018	1,499								

NOTES:
* Test computer: 16" MacBook Pro (M1 Pro SoC) 32 GB RAM
* macOS Monterey (12.6.1)
* Test storage: OWC Thunderblade (8 TB) connected via Thunderbolt 4.
* All tests measured using AJA System Test (Full version) v. 16.2.2.5
* All tests run five times.
* AJA test file (both versions): UHD, 16 GB ProRes 422 (maximum size allowed)
* First test results were always ignored, because they were higher than any other test.
* Lower standard deviation (St. Dev.) numbers indicate more consistent results.

Compare Write & Read Speeds by RAID Type - OWC Thunderblade 8 TB

Speeds averaged across five tests and measured by AJA System Test (Full version)

Speed Test: OWC ThunderBlade (RAID 0)

| | Theoretical | | SPEED TESTS | | | | | | | | VARIANCES | | | | | |
| | Theoretical | | Blackmagic Disk Speed Test | | AmorphousDiskMark | | AJA System Test (LIte) | | AJA System Test (Full) | | BMD vs. AJA Full | | AJA Full to Lite Variance | | Amorphous vs. AJA Full | |
	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (%)	Read (%)	Write (%)	Read (%)	Write (%)	Read (%)
Average	**2,850**	**2,850**	**2,829**	**2,180**	**2,847**	**2,824**	**1,571**	**1,662**	**1,904**	**2,011**	48.6%	8.4%	**21.2%**	**21.0%**	**49.5%**	**40.5%**
Maximum			2,844	2,289	2,860	2,824	1,833	1,798	2,189	2,185	29.9%	4.7%	19.4%	21.5%	30.7%	29.2%
Minimum			2,810	2,134	2,832	2,824	1,495	1,623	1,711	1,890	64.2%	12.9%	14.4%	16.5%	65.5%	49.4%
St. Dev.			15	62	12	0	147	76	253	157	-93.9%	-60.8%	72.2%	106.7%	-95.4%	-100.0%
Test 1			2,817	2,289	2,851	2,824	1,506	1,631	1,732	1,904						
Test 2			2,842	2,134	2,860	2,824	1,833	1,798	1,716	1,893						
Test 3			2,844	2,164	2,853	2,824	1,501	1,623	2,173	2,181						
Test 4			2,834	2,155	2,832	2,824	1,519	1,629	1,711	1,890						
Test 5			2,810	2,158	2,837	2,824	1,495	1,628	2,189	2,185						

NOTES
* Test storage: OWC 8 TB Thunderblade with four internal NVMe SSD 2 TB blades connected using Thunderbolt 3/4
* Test computer: 16" MacBook Pro, M1 PRO cpu, 32 GB RAM, macOS Monterey 12.6.1
* All tests run five times each.
* Always threw out the first test results because they were always higher than any other test.
* BMD: 4 GB test file
* AJA System Test (lite): UHD, 4 GB ProRes 422 test file.
* AJA System Test (full): UHD, 4 GB ProRes 422 test file.
* AmorphousDiskMark: 4GiB test file, in 1 MiB blocks
* Because AmorphousDiskMark using GiB files, test results were reduced by 2.3% to match the GB files used by AJA and BMD
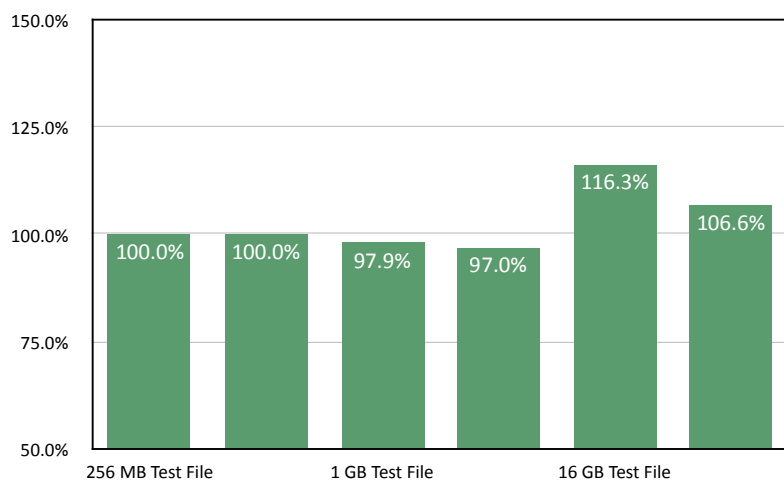* AmorphousDiskMark instructions are very unclear on which line was most representative, I used the top line.

Comparison: Single Drive vs. 3-Drive RAID 0

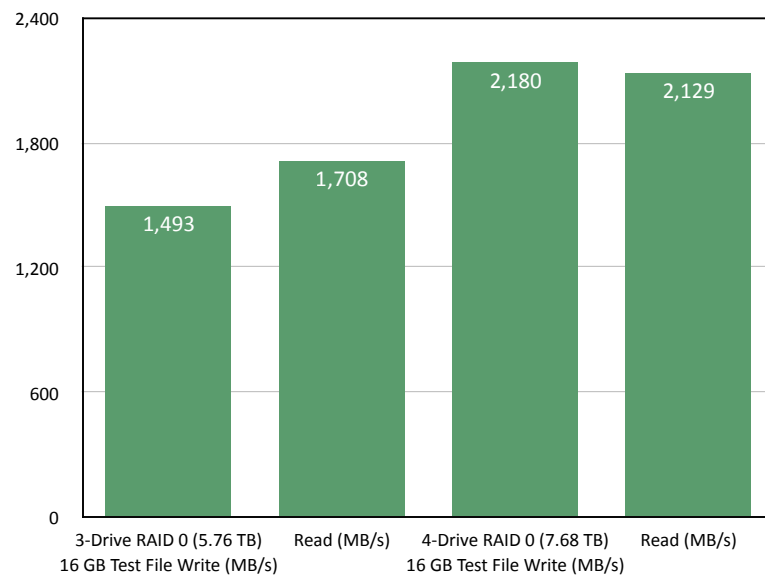|	Single Drive (1.92 TB) 16 GB Test File		3-Drive RAID 0 (5.76 TB) 16 GB Test File		4-Drive RAID 0 (7.68 TB) 256 MB Test File		4-Drive RAID 0 (7.68 TB) 1 GB Test File		4-Drive RAID 0 (7.68 TB) 16 GB Test File	
	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)	Write (MB/s)	Read (MB/s)
Average	**684**	**764**	**1,493**	**1,708**	**1,875**	**1,997**	**1,835**	**1,936**	**2,180**	**2,129**
Maximum	688	771	1,509	1,727	2,260	2,241	2,181	2,128	2,189	2,145
Minimum	676	758	1,465	1,671	1,737	1,915	1,734	1,877	2,173	2,115
St. Deviation	5	6	19	25	217	137	194	108	7	11
Variability					100.0%	100.0%	97.9%	97.0%	116.3%	106.6%
Test 1	687	770	1,509	1,723	1,737	1,944	1,734	1,887	2,173	2,130
Test 2	688	771	1,465	1,671	1,788	1,915	1,749	1,909	2,180	2,115
Test 3	684	760	1,483	1,692	1,780	1,932	1,753	1,879	2,173	2,123
Test 4	684	760	1,502	1,727	2,260	2,241	2,181	2,128	2,183	2,131
Test 5	676	758	1,508	1,726	1,808	1,952	1,756	1,877	2,189	2,145

NOTES:
* Test computer: 16" MacBook Pro (M1 Pro SoC) 32 GB RAM
* macOS Monterey (12.6.1)
* Test storage: OWC Thunderblade (8 TB) connected via Thunderbolt 4.
* 3-Drive RAID 0 created using Apple Disk Utility
* Test software: AJA System Test (Full version) version 16.2.2.5
* AJA test file: UHD (3840x2160 pixels), 16 GB ProRes 422 (maximum allowed)
* Lower standard deviation (St. Dev.) numbers indicate more consistent results.

How Data Rates Vary by Test File Size

Performance measured in MB/second using AJA System Test (Full)

3-drive RAID 0 vs. 4-drive RAID 0

Performance measured in MB/second using AJA System Test (Full)

LarryJordan.com

Formatted RAID Storage Capacity

Format	Capacity (TB / drive)
JBOD	1.92
RAID 0	7.68
RAID 1	1.92
RAID 4	5.76
RAID 5	5.76
RAID 1+0	3.84

Formatted Storage Capacity by RAID Level in TB