VMmark® 3.1.1 Results

Server Vendor & Model: HPE ProLiant DL345 Gen11 **Storage Vendor & Model: VMware vSAN 8.0 - All Flash** **Hypervisor: VMware ESXi 8.0b, Build 21203435** **Datacenter Management Software: VMware vCenter Server 8.0 GA Build 20519528**	**VMmark 3.1.1 Score = 28.90 @ 31 Tiles**

Number of Hosts: 4	**Uniform Hosts [yes/no]: yes**	**Total sockets/cores/threads in test: 4/256/512**
Tested By: Hewlett Packard Enterprise	**Test Date: 03-21-2023**	

Performance Section	**Configuration Section**	**Notes Section**
Performance	Configuration	Notes for Workload

Performance

	weathervane			weathervaneE			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.43	0.99	1.31 | 0.03	563.88	0.99	0.34 | 0.06	906.10	1.23	876.59	628.38	1.26	1040.09	445.48	1.28	1132.01	1.14
p1	3558.07	0.99	1.31 | 0.01	557.29	0.97	0.40 | 0.03	897.10	1.22	898.91	649.83	1.30	1036.03	482.75	1.39	1133.30	1.16
p2	3544.82	0.99	1.47 | 0.03	558.18	0.98	0.31 | 0.04	911.30	1.24	866.33	632.67	1.26	1015.39	447.38	1.29	1108.58	1.14
TILE_1	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3570.81	0.99	1.14 | 0.03	570.97	1.00	0.58 | 0.03	911.62	1.24	884.79	634.75	1.27	1028.69	447.70	1.29	1120.20	1.15
p1	3552.37	0.99	1.23 | 0.02	565.73	0.99	0.46 | 0.07	907.00	1.24	885.30	662.27	1.32	993.61	497.23	1.43	1074.90	1.18
p2	3540.86	0.98	1.18 | 0.02	555.00	0.97	0.32 | 0.02	917.60	1.25	871.14	641.02	1.28	1003.12	447.88	1.29	1118.12	1.15
TILE_2	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.50	0.99	1.49 | 0.06	561.81	0.98	0.48 | 0.04	908.77	1.24	893.53	613.30	1.23	1100.17	432.60	1.25	1197.90	1.13
p1	3558.05	0.99	1.52 | 0.10	558.73	0.98	0.50 | 0.09	898.48	1.22	917.90	631.73	1.26	1105.02	468.32	1.35	1203.01	1.15
p2	3553.70	0.99	1.38 | 0.08	554.15	0.97	0.46 | 0.06	903.95	1.23	886.56	623.83	1.25	1062.62	433.43	1.25	1182.61	1.13
TILE_3	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3573.92	0.99	1.40 | 0.07	566.90	0.99	0.41 | 0.01	921.17	1.25	836.42	648.65	1.30	969.33	451.32	1.30	1084.88	1.16
p1	3562.21	0.99	1.35 | 0.05	557.80	0.97	0.32 | 0.02	925.20	1.26	835.18	680.60	1.36	944.41	499.98	1.44	1054.44	1.19
p2	3548.02	0.99	1.43 | 0.08	557.51	0.97	0.49 | 0.12	932.98	1.27	820.30	655.88	1.31	956.97	455.73	1.31	1070.17	1.16
TILE_4	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.59	0.99	0.98 | 0.00	569.93	1.00	0.45 | 0.01	943.85	1.29	789.62	649.12	1.30	956.95	455.75	1.31	1061.01	1.17
p1	3567.53	0.99	0.83 | 0.00	566.74	0.99	0.43 | 0.05	932.85	1.27	811.07	669.25	1.34	967.08	491.30	1.42	1072.58	1.19
p2	3547.39	0.99	0.96 | 0.01	564.58	0.99	0.41 | 0.02	926.67	1.26	831.43	649.55	1.30	976.79	428.38	1.24	1105.93	1.15
TILE_5	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3570.64	0.99	1.09 | 0.01	570.93	1.00	0.65 | 0.13	931.73	1.27	831.46	648.77	1.30	973.98	449.00	1.29	1107.77	1.16
p1	3554.13	0.99	1.11 | 0.02	571.80	1.00	0.53 | 0.03	926.75	1.26	840.37	678.58	1.36	952.81	491.57	1.42	1080.68	1.19
p2	3543.68	0.98	1.18 | 0.01	566.27	0.99	0.62 | 0.07	937.77	1.28	809.19	660.05	1.32	939.91	432.10	1.25	1073.83	1.15

TILE_6	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3579.35	0.99	1.02 | 0.01	565.08	0.99	0.44 | 0.06	900.75	1.23	918.18	613.77	1.23	1103.06	425.75	1.23	1232.67	1.13
p1	3561.68	0.99	0.87 | 0.01	563.31	0.98	0.40 | 0.02	883.17	1.20	957.34	630.00	1.26	1120.76	462.70	1.33	1247.94	1.15
p2	3542.51	0.98	0.87 | 0.01	557.29	0.97	0.35 | 0.02	898.58	1.22	912.54	618.73	1.24	1086.34	409.38	1.18	1214.48	1.11
TILE_7	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3564.17	0.99	1.62 | 0.10	567.70	0.99	0.38 | 0.08	930.10	1.27	838.91	650.20	1.30	981.58	450.90	1.30	1110.42	1.16
p1	3553.49	0.99	1.56 | 0.04	563.42	0.98	0.40 | 0.04	927.80	1.26	825.22	678.62	1.36	943.50	499.93	1.44	1052.64	1.19
p2	3534.35	0.98	1.63 | 0.06	563.72	0.99	0.36 | 0.01	948.17	1.29	790.98	662.95	1.32	919.00	437.48	1.26	1041.50	1.16
TILE_8	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3575.67	0.99	0.90 | 0.00	566.47	0.99	0.35 | 0.02	887.23	1.21	945.74	618.70	1.24	1095.11	429.25	1.24	1219.11	1.13
p1	3568.85	0.99	0.86 | 0.00	563.37	0.98	0.41 | 0.02	905.67	1.23	905.16	646.38	1.29	1070.75	457.38	1.32	1167.35	1.15
p2	3567.67	0.99	0.89 | 0.00	560.17	0.98	0.40 | 0.08	901.50	1.23	918.00	601.75	1.20	1075.19	430.60	1.24	1211.09	1.12
TILE_9	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3575.85	0.99	0.86 | 0.00	562.89	0.98	0.49 | 0.15	892.95	1.22	953.07	618.92	1.24	1107.82	425.15	1.23	1264.05	1.13
p1	3563.51	0.99	0.86 | 0.00	562.22	0.98	0.40 | 0.01	896.88	1.22	934.82	640.15	1.28	1106.67	453.70	1.31	1207.70	1.15
p2	3557.36	0.99	0.80 | 0.00	559.26	0.98	0.32 | 0.02	904.55	1.23	928.08	605.38	1.21	1082.26	428.43	1.24	1220.95	1.12
TILE_10	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.89	0.99	0.74 | 0.00	564.66	0.99	0.31 | 0.05	873.27	1.19	1020.96	603.98	1.21	1182.74	428.50	1.24	1364.47	1.12
p1	3564.19	0.99	0.70 | 0.00	561.41	0.98	0.33 | 0.01	873.02	1.19	1024.80	615.98	1.23	1236.09	420.57	1.21	1407.46	1.12
p2	3541.94	0.98	0.75 | 0.00	558.91	0.98	0.40 | 0.03	871.35	1.19	1025.17	581.65	1.16	1204.46	404.30	1.17	1389.89	1.09
TILE_11	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3558.22	0.99	1.55 | 0.06	567.97	0.99	0.40 | 0.01	899.65	1.23	906.28	628.77	1.26	1053.86	450.25	1.30	1198.57	1.14
p1	3550.35	0.99	1.44 | 0.03	564.26	0.99	0.44 | 0.14	903.65	1.23	896.36	622.20	1.24	1063.81	450.25	1.30	1199.86	1.14
p2	3535.40	0.98	1.58 | 0.09	561.61	0.98	0.35 | 0.01	900.88	1.23	900.16	624.42	1.25	1066.71	428.95	1.24	1206.39	1.13
TILE_12	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3578.11	0.99	1.27 | 0.02	566.99	0.99	0.58 | 0.03	916.98	1.25	890.85	654.20	1.31	1037.39	456.30	1.32	1180.39	1.16
p1	3562.04	0.99	1.38 | 0.04	560.36	0.98	0.37 | 0.01	936.10	1.27	817.55	649.58	1.30	972.51	468.52	1.35	1106.03	1.17
p2	3541.23	0.98	1.61 | 0.03	559.04	0.98	0.44 | 0.02	921.62	1.26	872.92	629.38	1.26	1060.15	434.07	1.25	1187.00	1.14
TILE_13	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.32	0.99	1.22 | 0.02	565.72	0.99	0.37 | 0.01	921.98	1.26	861.25	657.20	1.31	1027.96	455.95	1.31	1166.41	1.16
p1	3564.93	0.99	1.23 | 0.02	562.88	0.98	0.41 | 0.02	920.95	1.25	864.47	635.27	1.27	1033.12	455.80	1.31	1165.52	1.15
p2	3554.97	0.99	1.30 | 0.03	561.47	0.98	0.32 | 0.01	931.92	1.27	841.90	642.60	1.28	1015.85	439.48	1.27	1168.40	1.15
TILE_14	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3578.45	0.99	1.83 | 0.16	563.16	0.98	0.38 | 0.08	888.10	1.21	964.63	625.02	1.25	1153.32	431.73	1.24	1288.09	1.13
p1	3557.35	0.99	2.21 | 0.25	557.16	0.97	0.41 | 0.01	888.75	1.21	964.16	602.55	1.20	1173.23	435.38	1.26	1294.20	1.12
p2	3540.91	0.98	1.92 | 0.16	556.19	0.97	0.47 | 0.03	893.70	1.22	960.08	602.83	1.20	1168.43	412.48	1.19	1323.39	1.11
TILE_15	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.67	0.99	1.63 | 0.09	564.74	0.99	0.32 | 0.01	955.90	1.30	764.20	692.67	1.38	892.29	490.12	1.41	1004.88	1.20

p1	3558.02	0.99	1.49 | 0.03	564.24	0.99	0.31 | 0.01	948.02	1.29	787.23	657.52	1.31	942.71	479.00	1.38	1054.60	1.18
p2	3535.22	0.98	1.59 | 0.06	565.84	0.99	0.46 | 0.15	940.98	1.28	798.13	654.50	1.31	961.49	448.43	1.29	1102.23	1.16
TILE_16	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3573.78	0.99	0.99 | 0.01	568.43	0.99	0.66 | 0.10	917.05	1.25	869.67	656.58	1.31	1034.67	458.50	1.32	1167.12	1.16
p1	3563.19	0.99	1.04 | 0.01	566.17	0.99	0.53 | 0.05	920.38	1.25	866.11	640.80	1.28	1000.97	466.23	1.34	1113.29	1.16
p2	3550.45	0.99	1.18 | 0.02	563.60	0.99	0.48 | 0.08	900.67	1.23	914.19	627.10	1.25	1068.22	429.77	1.24	1214.68	1.13
TILE_17	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.24	0.99	1.16 | 0.02	570.50	1.00	0.51 | 0.03	934.50	1.27	824.59	669.67	1.34	988.01	468.55	1.35	1105.02	1.18
p1	3564.94	0.99	1.15 | 0.02	560.73	0.98	0.35 | 0.01	942.30	1.28	812.23	645.52	1.29	993.97	468.80	1.35	1101.81	1.17
p2	3534.25	0.98	1.18 | 0.03	561.85	0.98	0.38 | 0.02	941.17	1.28	820.62	642.77	1.28	1010.22	443.02	1.28	1147.17	1.15
TILE_18	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3569.81	0.99	2.00 | 0.15	569.13	0.99	0.48 | 0.02	864.15	1.18	1043.70	603.88	1.21	1262.25	423.02	1.22	1376.67	1.11
p1	3550.71	0.99	2.33 | 0.38	564.02	0.99	0.33 | 0.01	854.05	1.16	1099.08	576.83	1.15	1318.72	387.52	1.12	1526.80	1.08
p2	3538.02	0.98	2.52 | 0.65	562.53	0.98	0.46 | 0.05	868.25	1.18	1037.47	583.33	1.17	1283.86	415.98	1.20	1443.51	1.10
TILE_19	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3563.22	0.99	0.86 | 0.00	567.51	0.99	0.31 | 0.00	907.58	1.24	892.61	646.80	1.29	1062.10	448.77	1.29	1202.64	1.15
p1	3562.30	0.99	0.88 | 0.00	565.10	0.99	0.31 | 0.02	911.55	1.24	875.95	626.42	1.25	1048.83	429.85	1.24	1186.08	1.13
p2	3539.40	0.98	0.91 | 0.00	563.07	0.98	0.54 | 0.17	910.73	1.24	892.46	624.73	1.25	1073.89	446.18	1.29	1223.41	1.14
TILE_20	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.96	0.99	0.96 | 0.00	564.96	0.99	0.49 | 0.02	946.92	1.29	788.35	685.90	1.37	917.72	482.68	1.39	1022.82	1.19
p1	3562.62	0.99	0.88 | 0.00	558.83	0.98	0.31 | 0.01	945.75	1.29	792.50	651.98	1.30	957.44	476.45	1.37	1042.43	1.17
p2	3546.48	0.99	1.10 | 0.00	556.55	0.97	0.44 | 0.04	926.48	1.26	839.78	651.88	1.30	966.12	451.23	1.30	1088.64	1.15
TILE_21	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3570.35	0.99	1.13 | 0.01	571.75	1.00	0.65 | 0.17	895.42	1.22	933.48	655.15	1.31	1057.71	451.00	1.30	1222.37	1.16
p1	3557.14	0.99	1.10 | 0.01	566.41	0.99	0.39 | 0.00	896.40	1.22	945.90	613.58	1.23	1151.04	419.00	1.21	1292.30	1.12
p2	3530.63	0.98	1.01 | 0.01	564.10	0.99	0.32 | 0.01	887.75	1.21	959.00	623.00	1.24	1102.94	441.40	1.27	1279.95	1.13
TILE_22	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3561.85	0.99	1.12 | 0.02	570.75	1.00	0.55 | 0.02	923.55	1.26	855.39	665.30	1.33	996.89	466.57	1.35	1121.21	1.17
p1	3543.99	0.99	1.01 | 0.00	565.82	0.99	0.46 | 0.02	943.77	1.29	793.99	650.85	1.30	958.99	454.43	1.31	1056.68	1.16
p2	3530.90	0.98	1.02 | 0.00	563.03	0.98	0.49 | 0.02	944.95	1.29	788.69	661.55	1.32	922.37	483.77	1.39	1033.47	1.18
TILE_23	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3565.28	0.99	0.73 | 0.00	564.43	0.99	0.32 | 0.00	857.15	1.17	1066.92	617.12	1.23	1220.89	418.48	1.21	1417.87	1.11
p1	3556.38	0.99	0.73 | 0.00	560.61	0.98	0.35 | 0.00	889.33	1.21	964.33	585.58	1.17	1159.16	409.75	1.18	1333.34	1.10
p2	3532.47	0.98	0.81 | 0.00	555.81	0.97	0.35 | 0.02	877.90	1.20	986.71	623.50	1.25	1182.65	428.15	1.23	1348.03	1.12
TILE_24	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.44	0.99	0.87 | 0.01	572.24	1.00	0.51 | 0.04	878.12	1.20	1018.68	626.17	1.25	1192.39	448.10	1.29	1358.96	1.14
p1	3554.30	0.99	0.88 | 0.00	566.34	0.99	0.31 | 0.04	882.23	1.20	1008.43	576.85	1.15	1234.47	406.62	1.17	1405.71	1.10
p2	3543.42	0.98	1.02 | 0.01	564.66	0.99	0.37 | 0.02	864.85	1.18	1051.95	615.77	1.23	1241.65	421.60	1.22	1433.60	1.11

TILE_25	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3576.95	0.99	1.07 | 0.01	565.44	0.99	0.37 | 0.02	935.08	1.27	822.20	672.48	1.34	971.56	493.75	1.42	1088.80	1.19
p1	3563.26	0.99	1.38 | 0.01	567.12	0.99	0.39 | 0.04	938.05	1.28	802.74	648.45	1.30	986.75	446.35	1.29	1108.42	1.16
p2	3550.66	0.99	1.22 | 0.01	563.78	0.99	0.32 | 0.02	935.20	1.27	818.99	672.52	1.34	979.74	468.00	1.35	1104.75	1.18
TILE_26	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.77	0.99	1.76 | 0.09	570.17	1.00	0.81 | 0.22	903.30	1.23	916.05	648.23	1.30	1089.22	463.77	1.34	1249.08	1.16
p1	3562.74	0.99	2.00 | 0.22	561.47	0.98	0.54 | 0.13	914.05	1.24	896.65	631.48	1.26	1080.14	427.05	1.23	1244.17	1.13
p2	3532.36	0.98	1.88 | 0.13	558.23	0.98	0.51 | 0.04	900.45	1.23	941.49	642.35	1.28	1117.82	439.35	1.27	1284.27	1.14
TILE_27	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.72	0.99	0.77 | 0.00	569.94	1.00	0.40 | 0.02	886.05	1.21	975.94	639.30	1.28	1120.98	465.15	1.34	1263.83	1.15
p1	3560.78	0.99	0.80 | 0.02	564.48	0.99	0.37 | 0.05	875.98	1.19	996.51	606.65	1.21	1179.50	413.68	1.19	1339.11	1.11
p2	3539.10	0.98	0.87 | 0.00	556.56	0.97	0.36 | 0.03	881.08	1.20	998.93	631.45	1.26	1165.94	439.32	1.27	1309.79	1.13
TILE_28	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.90	0.99	1.46 | 0.07	569.99	1.00	0.49 | 0.01	926.17	1.26	853.30	668.00	1.33	1001.32	485.00	1.40	1131.01	1.18
p1	3549.02	0.99	1.26 | 0.01	569.24	0.99	0.44 | 0.09	941.27	1.28	801.17	655.10	1.31	955.27	451.65	1.30	1093.16	1.16
p2	3530.04	0.98	1.36 | 0.02	564.69	0.99	0.47 | 0.02	909.65	1.24	890.28	653.90	1.31	1064.69	448.73	1.29	1227.25	1.15
TILE_29	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3569.05	0.99	1.33 | 0.05	567.24	0.99	0.39 | 0.04	912.95	1.24	872.52	661.62	1.32	1017.96	483.80	1.40	1144.19	1.18
p1	3557.84	0.99	1.45 | 0.06	568.82	0.99	0.45 | 0.07	918.65	1.25	879.89	633.70	1.27	1059.88	432.25	1.25	1217.84	1.14
p2	3535.22	0.98	1.37 | 0.06	565.84	0.99	0.33 | 0.05	923.58	1.26	859.32	665.67	1.33	1013.47	463.73	1.34	1145.28	1.17
TILE_30	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3557.11	0.99	1.78 | 0.08	566.20	0.99	0.31 | 0.00	834.42	1.14	1159.53	590.88	1.18	1358.30	420.43	1.21	1562.53	1.10
p1	3545.01	0.99	2.20 | 0.39	563.50	0.98	0.34 | 0.02	848.83	1.16	1108.01	576.20	1.15	1330.43	387.90	1.12	1543.95	1.08
p2	3522.79	0.98	1.94 | 0.16	562.85	0.98	0.39 | 0.02	860.35	1.17	1066.85	613.73	1.23	1245.73	425.75	1.23	1402.88	1.11
p0_score:	35.71															
p1_score:	35.56															
p2_score:	35.26															

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	56.00	42.00	36.00	20.00
Avg_Seconds_To_Complete	6.90	130.30	151.07	300.84
Failures	0.00	0.00	0.00	0.00
Ratio	2.15	2.33	2.00	2.50
Number_Of_Threads	2	2	2	2

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark3_Applications_Score	35.56	

Unreviewed_VMmark3_Infrastructure_Score	2.24
Unreviewed_VMmark3_Score	28.90

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 8.0b, Build 21203435 / 02-14-2023
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 8.0 GA Build 20519528 / 10-11-2022
Supplemental Software	None
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	4
Server Manufacturer and Model	HPE ProLiant DL345 Gen11
Processor Vendor and Model	AMD EPYC 9554P
Processor Speed (GHz) / Turbo Boost Speed (GHz)	3.10 / 3.75
Total Sockets/Total Cores/Total Threads	1 Sockets / 64 Cores / 128 Threads
Primary CPU Cache	32 KB I + 32 KB D on chip per core
Secondary CPU Cache	1 MB I+D on chip per core
Other CPU Cache	256 MB I+D on chip per chip
BIOS Version	A56 v1.24 (02/04/2023)
Memory Size (in GB, Number of DIMMs)	1536, 12
Memory Type and Speed	128 GB 4Rx4 DDR5-4800 MHz RDIMM
Disk Subsystem Type	vSAN, FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HPE NS204i-u boot controller
Total Number of Physical Disks for Hypervisor	2

Disk Vendors, Models, Capacities, and Speeds	HPE 480 GB NVMe M.2 SSD
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	HPE SN1610Q 32Gb 2p FC HBA
Number of Network Controllers	2
Network Controller Vendors and Models	Mellanox MCX623106AS 100GbE 2p QSFP56 Adapter Mellanox MCX631432AS 10/25GbE 2p OCP3 Adapter
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	03-15-2023
BIOS Availability Date (MM-DD-YYYY)	06-12-2023
Software Availability Date (MM-DD-YYYY)	05-15-2023
Network	
Network Switch Vendors and Models	HPE SN2700M 100GbE 32QSFP28
Network Speed	DSwitch-VM-Network: 25 Gbps DSwitch-Management-Network: 100 Gbps for SUT, 1 Gbps for Client DSwitch-vMotion: 100 Gbps for SUT, 1 Gbps for Client
Primary Storage	
Storage Category	VMware vSAN
Storage Vendors, Models, and Firmware Versions	4 x HPE ProLiant DL345 Gen11 servers in a VMware vSAN 8.0 cluster
Storage Configuration Summary	VMware vSAN • 3 x Disk Groups per host • 3 x HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD • 9 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
Datacenter Management Server	
System Model	HPE ProLiant DL360 Gen10
Processor Vendor and Model	Intel Xeon Gold 6258R
Processor Speed (GHz)	2.7
Total Sockets/Total Cores/Total Threads	2 Sockets / 56 Cores / 112 Threads
Memory Size (in GB, Number of DIMMs)	256, 16
Network Controller(s) Vendors and Models	HPE 1Gb Ethernet 4-Port 331 FLR Adapter

Operating System, Version, Bitness, and Service Pack	VMware ESXi 8.0 GA Build 20513097
Virtual Center VM Number of vCPUs	16
Virtual Center VM Virtual Memory (in GB)	39 GB
Virtual Center VM Operating System, Version, Bitness, and Service Pack	VMware vCenter Server 8.0 GA Build 20519528
Other Hardware	None
Other Software	None

Clients	
Total Number of Virtual Clients / Virtual Client Hosts	32 / 4
System Model(s)	HPE ProLiant DL380 Gen10 Plus
Processor Vendor(s) and Model(s)	Intel Xeon Platinum 8380
Processor Speed(s) (GHz)	2.3
Total Sockets/Total Cores/Total Threads	8 Sockets / 320 Cores / 640 Threads
Memory per Virtual Client Host	2 TB
Network Controller(s) Vendors and Models	• 1 x Intel I350-T4 Ethernet 1Gb 4-port BASE-T OCP3 Adapter for HPE • 1 x Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 Adapter for HPE
Virtual Client Networking Notes	Details in Networking Notes
Virtual Client Storage Notes	Details in Client Notes
Other Hardware	1 * HPE SN1610Q 32Gb 2p FC HBA
Other Software	VMware ESXi 8.0 GA Build 20513097

Security Mitigations						
Vulnerability	**CVE**	**Exploit Name**	**Public Vulnerability Name**	**Mitigated**		
				Server Firmware	**ESXi**	**Guest OS**
Spectre	2017-5753	Variant 1	Bounds Check Bypass	N/A	Not Vulnerable	Not Vulnerable
Spectre	2017-5715	Variant 2	Branch Target Injection	Not Vulnerable	Not Vulnerable	Not Vulnerable
Meltdown	2017-5754	Variant 3	Rogue Data Cache Load	N/A	Not Vulnerable	Not Vulnerable
Spectre-NG	2018-3640	Variant 3a	Rogue System Register Read	Not Vulnerable	N/A	N/A
Spectre-NG	2018-3639	Variant 4	Speculative Store Bypass	N/A	Not Vulnerable	Not Vulnerable
Foreshadow	2018-3615	Variant 5	L1 Terminal Fault - SGX	N/A	N/A	N/A
Foreshadow-NG	2018-3620	Variant 5	L1 Terminal Fault - OS	N/A	N/A	Not Vulnerable

Foreshadow-NG	2018-3646	Variant 5	L1 Terminal Fault - VMM	N/A	Not Vulnerable	N/A

Notes for Workload

Template deployed with disk type: Thick

Virtualization Software Notes

- Cluster DRS Automation Level set to Fully Automated
- vSphere DRS Migration Threshold level set to 2
- vSphere DRS Advanced Option AggressiveCPUActive set to 1
- Logical CPU layout changed for all multi-CPU VMs to 1 socket with multiple cores (default single core per socket)
- Logging was disabled for all VMs (default enabled)
- All DS3DB, ElasticDB, and ElasticLB VMs had CPU shares set to High (default Normal)
- All Standby VMs had CPU shares set to Low (default Normal)
- All memory reserved (LockedToMax) for all DS3DB VMs
- sched.mem.lpage.enable1GPage set to TRUE for all DS3DB VMs (default FALSE)
- DS3DB0 was configured to not use the third virtual disk before building additional tiles.
- CD and floppy devices were removed from all VMs (default installed)
- PrimeClient's second virtual disk configured to be 1.2 TB (default: 200 GB)

Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.CreditAgePeriod = 1000 (default 3000)
- Cpu.HTWholeCoreThreshold = 0 (default 800)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Disk.IdleCredit = 64 (default 32)
- Disk.ReqCallThreshold = 1 (default 8)
- Mem.CtlMaxPercent = 0 (default 65)
- Mem.ShareScanGHz = 0 (default 4)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.LargeInterleave = 0 (default 1)
- Numa.LocalityWeightActionAffinity = 0 (default 130)
- Numa.MigImbalanceThreshold = 57 (default 10)
- Numa.MigPreventLTermThresh = 20 (default 0)
- Numa.MigThreshold = 0 (default 2)
- Numa.MonMigEnable = 0 (default 1)
- Numa.PageMigEnable = 0 (default 1)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapLoadEnable = 0 (default 1)
- Numa.SwapLocalityEnable =0 (default 1)
- Power.CpuPolicy = 'High Performance' (default Balanced)
- UserVars.HostClientCEIPOptIn = 2 (default 0)

Server Notes

Server BIOS settings

- HPE Workload Profile set to "Virtualization - Max Performance" (default: General Power Efficient Compute)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- Memory Patrol Scrubbing set to disabled(default: Enabled)
- Memory PStates set to Disabled (default: Auto)
- Maximum Memory Bus Frequency set to "4800 MHz" (default: Auto)
- Package Power Limit Control Mode set to Manual (default: Auto)
- Package Power Limit Value set to 400 (default: 0)
- Numa Nodes per socket = 4 (default:Auto)

Networking Notes

Distributed vSwitch configuration:

- All SUT and client hosts were part of the same distributed vSwitch.
- The MTU of the distributed vSwitch was set to 9000 (default 1500). Except where noted differently below, the same change was made to all vmnics, vmk1, and vmk2.
- 'DSwitch-Management-Network' port group
    - Uplinks:
        - vmnic0 on SUT hosts
        - vmnic2 on client hosts
    - Usage:
        - vmk0(MTU 1500) on all SUT and client hosts - used for management
        - One virtual NIC port of PrimeClient VM
- 'DSwitch-vMotion' port group
    - Uplinks:
        - vmnic0 on SUT hosts
        - vmnic2 on client hosts
    - Usage:
        - vmk1 on all SUT hosts - used for vMotion
        - vmk1(MTU 1500) on all client hosts - used for vMotion
- 'DSwitch-VM-Network' port group
    - Uplinks:
        - SUT hosts: vmnic2, vmnic3
        - client hosts: vmnic0, vmnic1
    - Usage:
        - All VMs - including one virtual NIC port of PrimeClient VM

HPE SN2700M switch was configured for RoCE lossless and LLDP.

Storage Notes

OS Storage

- On each SUT host, VMware ESXi 8.0b was installed on HPE NS204i-u boot controller, which provides a RAID1 volume on 2 x 480 GB NVMe M.2 SSDs.
- On client hosts, VMware ESXi 8.0 GA was installed on a RAID1 volume on 2 x HPE 800GB SAS MU SFF SC SED FIPS PM6 SSD.
    - HPE Smart Array P408i-a SR Gen10

Primary Storage: VMware vSAN storage

- VMware vSAN 8.0 OSA
  - Capacity: 209.59 TB
  - Cache: 17.52 TB
  - Hardware Configuraiton
    - Each host had 3 disk groups. Each disk group had:
      - Cache Tier: 1 x HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
      - Capacity Tier: 3 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
  - Software Configuration
    - RDMA support service enabled (for vSAN over RDMA feature)
    - SUT vSAN Datastore was used for all SUT VMs and template VMs. Following changes were made to "vSAN Default Storage Policy":
      - "Disable object checksum" set to enable (default: disable)
      - "Object space reservation" set to "Thick provisioning" (default: Thin provisioning)

Secondary Storage: FC Channel Target via SCSI Target Server (LIO)

- All client hosts were configured to use Round Robin path policy (default Most Recently Used) with iops = 1 (default 1000).
- Hardware details:
  - HPE ProLiant DL380 Gen10 Plus
    - 2 x Intel Xeon Platinum 8380 (2.30 GHz)
    - 2048 GB (32 x 64GB 2Rx4 3200 MHz DDR4 RDIMMs)
    - 3 x HPE SN1610Q 32Gb 2-port FC HBA used as FC target controller
    - 2 x HPE 1.6TB SAS MU SFF SC DS SSD
    - 2 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
- Software details:
  - Operating System: SUSE Linux Enterprise Server 15 SP4 - 5.14.21-150400.22-default x86_64
  - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 15 SP4)
- LUN details:
  - 2 x HPE 1.6TB SAS MU SFF SC DS SSD configured as RAID1 Volume using HPE Smart Array P408i-a SR Gen10
    - 1 LUN(1.46 TB)
    - Storage system OS (not exported as FC target LUN)
  - 1 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
    - 1 LUN (1 TB): SVmotion Target LUN
    - 1 LUN (1 TB): DeployTarget LUN
  - 1 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
    - 1 LUN (5.82 TB): XVmotion Target LUN

Datacenter Management Server Notes

VMware vCenter Server Appliance 8.0 GA, Build 20519528 was hosted on a HPE ProLiant DL360 Gen10 system that was not part of the client or SUT clusters.

Operating System Notes

OS installation on SUT hosts was done using the HPE customized ESXi 8.0b ISO for ProLiant Gen11 servers.This is a pre-released version, which will be publicly released and available for customers to access by the provided Availability Date.
OS installation on client hosts was done using the VMware ESXi 8.0 GA, Build 20513097 ISO as released by VMware for OS installation. After the OS was installed, VIB packages were downloaded from the URLs listed below and were installed.

- http://vibsdepot.hpe.com/hpe/oct2022/esxi-800-devicedrivers/
- http://vibsdepot.hpe.com/hpe/oct2022/esxi-800-bundles/

Software Notes

None

Client Notes

Advanced ESXi settings:

- Power.CpuPolicy = High Performance (default Balanced)
- UserVars.HostClientCEIPOptIn = 2 (default 0)

Server BIOS settings:

- HPE Workload Profile set to "Virtualization - Max Performance" (default: General Power Efficient Compute)

The client VMs were distributed across the client hosts as follows:

- Client host 1: Client5,Client10,Client15,Client11,Client20,Client21,Client25,Client30
- Client host 2: Client2,Client4,Client12,Client14,Client17,Client19,Client22,Client24
- Client host 3: Client7,Client8,Client9,Client13,Client18,Client23,Client28
- Client host 4: Client0,Client1,Client3,Client6,Client16,Client26,Client27,Client29,PrimeClient

Client Storage: FC Channel Target via SCSI Target Server (LIO)

- Hardware details:
    - HPE ProLiant DL380 Gen10 Plus
        - 2 x Intel Xeon Platinum 8380 (2.30 GHz)
        - 2048 GB (32 x 64GB 2Rx4 3200 MHz DDR4 RDIMMs)
        - 2 x HPE SN1610Q 32Gb 2-port FC HBA used as FC target controller
        - 2 x HPE 1.6TB SAS MU SFF SC DS SSD
        - 1 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
        - 1 x HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
- Software details:
    - Operating System: SUSE Linux Enterprise Server 15 SP4 - 5.14.21-150400.22-default x86_64
    - Fibre Channel Target SW: LIO (part of SUSE Linux Enterprise Server 15 SP4)
- LUN details:
    - 2 x HPE 1.6TB SAS MU SFF SC DS SSD configured as RAID1 Volume using HPE Smart Array E208i-a SR Gen10
        - 1 LUN(1.46 TB)
        - Storage system OS (not exported as FC target LUN)
    - 1 x HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
        - 1 LUN(5.82 TB): ClientVMs
    - 1 x HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD
        - 1 LUN(1.46 TB): PrimeClient VM

Other Notes

VMmark3.properties file modifications:

- TileDelay = 5 (default 60)
- VCscratchDir = /root/VMmark3/results/scratch (default /root/VMmark3/samples)

- ErrorImmediate = true (default false)

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