

VMware® VMmark® V2.5.2 Results

Vendor and Hardware Platform: HP ProLiant DL380 Gen9
 Virtualization Platform: VMware ESXi 5.5.0 U2 Build 1909291
 VMware vCenter Server : VMware vCenter Server 5.5.0 U2 Build 1909363

**VMmark V2.5.2 Server and Storage PPKW Score =
12.7058 @ 20 Tiles**

| | | |
|--|--|---|
| Number of Hosts: 2 | Uniform Hosts [yes/no]: yes | Total sockets/cores/threads in test: 4/72/144 |
| Tested By: Hewlett-Packard | | Test Date: 08-19-2014 |
| Performance Section Performance | Configuration Section Configuration | Notes Section Notes for Workload |

Performance

| | mailserver | | | olio | | | dvdstoreA | | | dvdstoreB | | | dvdstoreC | | | |
|---------------|------------|-------|-------|---------|-------|--------|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|------|
| TILE_0 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 327.80 | 0.99 | 73.58 | 4649.85 | 1.00 | 199.55 | 4214.55 | 1.92 | 56.33 | 3061.07 | 2.02 | 60.78 | 2193.90 | 2.07 | 63.84 | 1.51 |
| p1 | 330.85 | 1.00 | 73.00 | 4630.05 | 1.00 | 210.90 | 4157.07 | 1.89 | 58.35 | 3119.88 | 2.05 | 62.59 | 2374.25 | 2.24 | 65.17 | 1.54 |
| p2 | 326.68 | 0.99 | 73.00 | 4618.88 | 1.00 | 226.53 | 4019.35 | 1.83 | 63.23 | 2911.50 | 1.92 | 68.10 | 2090.57 | 1.98 | 71.13 | 1.47 |
| TILE_1 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 328.18 | 0.99 | 74.00 | 4645.88 | 1.00 | 194.47 | 4206.98 | 1.91 | 56.31 | 3170.05 | 2.09 | 59.90 | 2312.88 | 2.19 | 62.71 | 1.54 |
| p1 | 328.82 | 1.00 | 74.00 | 4634.65 | 1.00 | 206.17 | 4193.75 | 1.91 | 56.85 | 3043.20 | 2.00 | 61.08 | 2285.75 | 2.16 | 63.99 | 1.52 |
| p2 | 325.12 | 0.98 | 81.75 | 4618.35 | 1.00 | 227.44 | 4047.62 | 1.84 | 62.15 | 2926.20 | 1.93 | 67.19 | 2096.97 | 1.98 | 70.64 | 1.47 |
| TILE_2 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 328.48 | 0.99 | 74.00 | 4648.25 | 1.00 | 199.84 | 4096.70 | 1.86 | 60.35 | 3086.78 | 2.03 | 64.18 | 2240.85 | 2.12 | 67.72 | 1.52 |
| p1 | 326.43 | 0.99 | 74.00 | 4649.07 | 1.00 | 213.75 | 4115.75 | 1.87 | 59.76 | 2977.00 | 1.96 | 64.88 | 2226.72 | 2.10 | 68.24 | 1.50 |
| p2 | 327.27 | 0.99 | 79.75 | 4620.30 | 1.00 | 223.15 | 3970.12 | 1.81 | 65.48 | 2875.68 | 1.89 | 70.21 | 2049.25 | 1.94 | 74.36 | 1.46 |
| TILE_3 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 326.15 | 0.99 | 68.90 | 4673.07 | 1.01 | 191.59 | 4197.75 | 1.91 | 56.98 | 3148.18 | 2.07 | 61.04 | 2406.65 | 2.27 | 63.22 | 1.57 |
| p1 | 327.65 | 0.99 | 74.00 | 4653.02 | 1.00 | 204.45 | 4239.02 | 1.93 | 55.72 | 3074.32 | 2.02 | 60.07 | 2211.57 | 2.09 | 62.92 | 1.52 |
| p2 | 328.82 | 1.00 | 74.00 | 4627.65 | 1.00 | 224.32 | 4081.50 | 1.86 | 60.92 | 3088.85 | 2.03 | 64.40 | 2244.50 | 2.12 | 67.26 | 1.55 |
| TILE_4 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 326.43 | 0.99 | 74.00 | 4652.23 | 1.00 | 193.54 | 4192.62 | 1.91 | 56.58 | 3096.12 | 2.04 | 58.85 | 2256.45 | 2.13 | 59.66 | 1.52 |
| p1 | 320.18 | 0.97 | 77.50 | 4632.80 | 1.00 | 208.35 | 4158.40 | 1.89 | 57.70 | 3165.60 | 2.08 | 59.91 | 2343.90 | 2.22 | 60.71 | 1.53 |
| p2 | 327.48 | 0.99 | 84.00 | 4649.02 | 1.00 | 216.69 | 4005.78 | 1.82 | 63.31 | 2939.95 | 1.94 | 66.42 | 2249.32 | 2.13 | 66.89 | 1.49 |
| TILE_5 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 333.30 | 1.01 | 73.47 | 4628.85 | 1.00 | 201.81 | 4218.82 | 1.92 | 55.87 | 3100.88 | 2.04 | 58.54 | 2253.15 | 2.13 | 59.61 | 1.53 |

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|----------------|--------|-------|-------|---------|-------|--------|---------|-------|-------|---------|-------|-------|---------|-------|-------|------|
| p1 | 330.45 | 1.00 | 73.58 | 4628.88 | 1.00 | 209.85 | 4194.95 | 1.91 | 56.53 | 3190.57 | 2.10 | 59.02 | 2458.85 | 2.32 | 59.48 | 1.56 |
| p2 | 329.68 | 1.00 | 82.90 | 4631.27 | 1.00 | 207.96 | 4052.70 | 1.84 | 61.61 | 2964.32 | 1.95 | 64.95 | 2168.40 | 2.05 | 65.48 | 1.49 |
| TILE_6 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 325.15 | 0.98 | 74.25 | 4648.18 | 1.00 | 190.26 | 2718.70 | 1.24 | 53.58 | 3083.00 | 2.03 | 59.63 | 2240.20 | 2.12 | 61.11 | 1.39 |
| p1 | 324.52 | 0.98 | 74.00 | 4629.45 | 1.00 | 209.70 | 2570.00 | 1.17 | 53.91 | 3174.15 | 2.09 | 60.10 | 2431.40 | 2.30 | 61.72 | 1.41 |
| p2 | 325.93 | 0.99 | 83.50 | 4614.88 | 0.99 | 233.16 | 2515.75 | 1.14 | 57.01 | 2991.38 | 1.97 | 64.41 | 2051.97 | 1.94 | 66.36 | 1.34 |
| TILE_7 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 325.52 | 0.99 | 67.92 | 4665.05 | 1.01 | 190.11 | 4197.32 | 1.91 | 56.72 | 3195.78 | 2.10 | 59.05 | 2353.72 | 2.22 | 60.30 | 1.55 |
| p1 | 326.85 | 0.99 | 74.00 | 4650.20 | 1.00 | 206.03 | 4237.23 | 1.93 | 55.60 | 3096.55 | 2.04 | 58.81 | 2351.93 | 2.22 | 60.37 | 1.54 |
| p2 | 331.00 | 1.00 | 74.00 | 4628.27 | 1.00 | 213.28 | 4090.07 | 1.86 | 60.55 | 3006.25 | 1.98 | 63.42 | 2171.45 | 2.05 | 65.73 | 1.51 |
| TILE_8 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 328.38 | 0.99 | 84.00 | 4663.73 | 1.00 | 188.67 | 4195.50 | 1.91 | 56.43 | 3108.68 | 2.05 | 58.02 | 2379.20 | 2.25 | 58.44 | 1.54 |
| p1 | 324.95 | 0.98 | 84.00 | 4651.62 | 1.00 | 207.71 | 4152.05 | 1.89 | 57.67 | 3091.93 | 2.04 | 58.93 | 2254.80 | 2.13 | 59.70 | 1.52 |
| p2 | 326.50 | 0.99 | 84.00 | 4619.32 | 1.00 | 215.45 | 4000.90 | 1.82 | 63.42 | 3059.72 | 2.01 | 65.27 | 2358.75 | 2.23 | 65.75 | 1.52 |
| TILE_9 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 329.50 | 1.00 | 73.45 | 4649.50 | 1.00 | 188.89 | 4234.75 | 1.93 | 55.42 | 3130.18 | 2.06 | 57.32 | 2393.28 | 2.26 | 57.92 | 1.55 |
| p1 | 330.50 | 1.00 | 73.47 | 4632.27 | 1.00 | 204.46 | 4217.98 | 1.92 | 55.78 | 3128.97 | 2.06 | 57.37 | 2286.45 | 2.16 | 58.05 | 1.54 |
| p2 | 326.45 | 0.99 | 73.28 | 4622.43 | 1.00 | 210.59 | 4058.65 | 1.85 | 61.50 | 3107.07 | 2.05 | 63.19 | 2398.25 | 2.27 | 63.85 | 1.53 |
| TILE_10 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 329.55 | 1.00 | 83.38 | 4634.55 | 1.00 | 207.82 | 4114.82 | 1.87 | 59.36 | 3041.80 | 2.00 | 61.27 | 2225.70 | 2.10 | 61.84 | 1.51 |
| p1 | 329.38 | 1.00 | 83.92 | 4624.82 | 1.00 | 222.22 | 4106.05 | 1.87 | 59.56 | 3148.65 | 2.07 | 61.08 | 2335.93 | 2.21 | 61.14 | 1.53 |
| p2 | 327.18 | 0.99 | 84.00 | 4624.75 | 1.00 | 212.78 | 3963.15 | 1.80 | 64.80 | 2936.72 | 1.93 | 66.59 | 2251.82 | 2.13 | 66.96 | 1.49 |
| TILE_11 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 331.57 | 1.00 | 83.17 | 4659.60 | 1.00 | 197.81 | 4205.27 | 1.91 | 56.32 | 3102.35 | 2.04 | 58.49 | 2261.00 | 2.14 | 59.26 | 1.55 |
| p1 | 331.48 | 1.00 | 84.00 | 4645.55 | 1.00 | 214.95 | 4202.38 | 1.91 | 56.12 | 3206.90 | 2.11 | 58.55 | 2470.40 | 2.33 | 58.77 | 1.60 |
| p2 | 324.18 | 0.98 | 84.00 | 4638.18 | 1.00 | 207.68 | 4077.38 | 1.85 | 60.84 | 2991.15 | 1.97 | 63.97 | 2187.05 | 2.07 | 64.45 | 1.51 |
| TILE_12 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 322.95 | 0.98 | 73.47 | 4662.48 | 1.00 | 191.04 | 4212.23 | 1.92 | 56.17 | 3328.32 | 2.19 | 58.11 | 2432.20 | 2.30 | 61.32 | 1.57 |
| p1 | 324.93 | 0.98 | 73.92 | 4631.75 | 1.00 | 213.34 | 4169.55 | 1.90 | 57.64 | 3069.97 | 2.02 | 60.28 | 2301.12 | 2.17 | 63.33 | 1.52 |
| p2 | 327.85 | 0.99 | 74.00 | 4614.73 | 0.99 | 211.36 | 4031.03 | 1.83 | 62.80 | 2977.72 | 1.96 | 65.05 | 2122.68 | 2.01 | 69.10 | 1.48 |
| TILE_13 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 324.40 | 0.98 | 83.00 | 4669.73 | 1.01 | 190.35 | 4209.00 | 1.91 | 55.88 | 3216.30 | 2.12 | 57.89 | 2443.72 | 2.31 | 60.14 | 1.56 |
| p1 | 327.30 | 0.99 | 75.75 | 4640.65 | 1.00 | 205.39 | 4206.65 | 1.91 | 56.17 | 3108.53 | 2.05 | 58.39 | 2218.45 | 2.10 | 62.02 | 1.52 |
| p2 | 327.77 | 0.99 | 84.00 | 4631.73 | 1.00 | 214.25 | 4039.45 | 1.84 | 62.00 | 3089.95 | 2.03 | 63.98 | 2248.25 | 2.12 | 66.95 | 1.51 |
| TILE_14 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |

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|------------------|--------|-------|-------|---------|-------|--------|---------|-------|-------|---------|-------|-------|---------|-------|-------|------|
| p0 | 328.30 | 0.99 | 84.00 | 4648.85 | 1.00 | 192.74 | 4118.27 | 1.87 | 59.37 | 3046.78 | 2.01 | 61.23 | 2297.78 | 2.17 | 63.83 | 1.55 |
| p1 | 327.15 | 0.99 | 84.00 | 4623.00 | 1.00 | 210.19 | 4128.68 | 1.88 | 58.92 | 3061.82 | 2.02 | 60.59 | 2203.50 | 2.08 | 63.55 | 1.53 |
| p2 | 327.60 | 0.99 | 84.00 | 4612.98 | 0.99 | 221.33 | 3968.80 | 1.80 | 64.90 | 3035.57 | 2.00 | 66.97 | 2302.60 | 2.18 | 69.83 | 1.53 |
| TILE_15 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 331.10 | 1.00 | 83.12 | 4662.65 | 1.00 | 187.10 | 3406.85 | 1.55 | 54.54 | 3068.68 | 2.02 | 57.72 | 2241.68 | 2.12 | 60.73 | 1.49 |
| p1 | 328.88 | 1.00 | 83.95 | 4637.48 | 1.00 | 206.50 | 3409.68 | 1.55 | 53.86 | 3240.38 | 2.13 | 56.63 | 2395.75 | 2.26 | 56.79 | 1.56 |
| p2 | 327.95 | 0.99 | 84.00 | 4660.30 | 1.00 | 206.07 | 3321.68 | 1.51 | 57.79 | 3032.20 | 2.00 | 61.92 | 2314.15 | 2.19 | 62.28 | 1.48 |
| TILE_16 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 326.25 | 0.99 | 84.67 | 4648.05 | 1.00 | 190.77 | 4175.90 | 1.90 | 57.46 | 3032.18 | 2.00 | 61.76 | 2180.65 | 2.06 | 64.81 | 1.51 |
| p1 | 329.15 | 1.00 | 84.00 | 4639.82 | 1.00 | 201.51 | 4161.15 | 1.89 | 57.84 | 3102.65 | 2.04 | 63.21 | 2359.82 | 2.23 | 65.83 | 1.54 |
| p2 | 327.55 | 0.99 | 84.00 | 4632.93 | 1.00 | 222.33 | 4013.32 | 1.82 | 63.33 | 2901.70 | 1.91 | 68.37 | 2081.55 | 1.97 | 71.79 | 1.47 |
| TILE_17 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 326.77 | 0.99 | 78.75 | 4663.30 | 1.00 | 192.29 | 4240.07 | 1.93 | 55.36 | 3197.88 | 2.11 | 59.20 | 2325.22 | 2.20 | 61.93 | 1.55 |
| p1 | 327.77 | 0.99 | 74.00 | 4646.85 | 1.00 | 191.43 | 4221.20 | 1.92 | 56.26 | 3059.15 | 2.01 | 60.81 | 2303.55 | 2.18 | 63.52 | 1.53 |
| p2 | 323.70 | 0.98 | 80.75 | 4624.25 | 1.00 | 228.31 | 4066.60 | 1.85 | 61.67 | 2944.43 | 1.94 | 66.57 | 2100.35 | 1.99 | 70.80 | 1.47 |
| TILE_18 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 325.32 | 0.99 | 83.62 | 4654.00 | 1.00 | 198.76 | 4117.60 | 1.87 | 60.06 | 3196.18 | 2.10 | 63.60 | 2356.70 | 2.23 | 66.49 | 1.57 |
| p1 | 325.57 | 0.99 | 83.22 | 4628.27 | 1.00 | 220.96 | 4118.07 | 1.87 | 59.75 | 2977.40 | 1.96 | 64.78 | 2237.22 | 2.11 | 67.67 | 1.55 |
| p2 | 324.80 | 0.98 | 83.50 | 4628.40 | 1.00 | 224.00 | 3969.95 | 1.81 | 65.40 | 2883.75 | 1.90 | 69.88 | 2064.62 | 1.95 | 73.57 | 1.50 |
| TILE_19 | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | Actual | Ratio | QoS | GM |
| p0 | 327.12 | 0.99 | 84.00 | 4666.30 | 1.01 | 185.45 | 4203.18 | 1.91 | 56.58 | 3160.85 | 2.08 | 60.47 | 2411.45 | 2.28 | 62.56 | 1.58 |
| p1 | 327.85 | 0.99 | 84.00 | 4651.88 | 1.00 | 202.72 | 4231.25 | 1.92 | 55.58 | 3063.03 | 2.02 | 60.06 | 2208.15 | 2.09 | 62.97 | 1.56 |
| p2 | 327.07 | 0.99 | 83.95 | 4641.05 | 1.00 | 209.54 | 4059.53 | 1.85 | 61.68 | 3060.93 | 2.02 | 65.12 | 2230.12 | 2.11 | 67.77 | 1.54 |
| p0_score: | 30.67 | | | | | | | | | | | | | | | |
| p1_score: | 30.63 | | | | | | | | | | | | | | | |
| p2_score: | 29.80 | | | | | | | | | | | | | | | |

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|--|--|--|--|--|--|--|--|--|--|---------|--|--|----------|--|--|--------|--|
| Infrastructure_Operations_Scores: | | | | | | | | | | vmotion | | | svmotion | | | deploy | |
| Completed_Ops_PerHour | | | | | | | | | | 17.00 | | | 11.00 | | | 5.50 | |
| Avg_Seconds_To_Complete | | | | | | | | | | 32.24 | | | 14.50 | | | 307.28 | |
| Failures | | | | | | | | | | 0.00 | | | 0.00 | | | 0.00 | |
| Ratio | | | | | | | | | | 1.06 | | | 1.22 | | | 1.38 | |
| Number_Of_Threads | | | | | | | | | | 1 | | | 1 | | | 1 | |

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|------------------------------|---|
| PTD_Summary: | |
| Number_of_PTD_Daemons | 3 |

| | | | | | | | |
|--|----------|---------------------------------|-----------|----------|--------|------------------|---------|
| Number_of_PTD_Phases | 3 | | | | | | |
| PTD_Phase_Timing | 2400secs | | | | | | |
| PtdTiming: | ptd0 | ptd1 | ptd2 | | | | |
| p0 | 0 | 0 | 0 | | | | |
| p1 | 0 | 0 | 0 | | | | |
| p2 | 0 | 0 | 0 | | | | |
| PTD_Results: | | | | | | | |
| p0 | Target | Avg_Watts | Avg_Volts | Avg_Amps | Avg_PF | Samples | UnCert% |
| ptd0 | SERVER | 695.04 | 209.55 | 3.32 | 1.00 | 2399.00 | 0.00 |
| ptd1 | SERVER | 703.75 | 218.03 | 3.23 | 1.00 | 2399.00 | 0.00 |
| ptd2 | EXT_STOR | 553.59 | 214.56 | 2.62 | 0.98 | 2399.00 | 0.00 |
| p1 | Target | Avg_Watts | Avg_Volts | Avg_Amps | Avg_PF | Samples | UnCert% |
| ptd0 | SERVER | 695.70 | 209.33 | 3.33 | 1.00 | 2400.00 | 0.00 |
| ptd1 | SERVER | 703.06 | 217.48 | 3.24 | 1.00 | 2400.00 | 0.00 |
| ptd2 | EXT_STOR | 548.69 | 213.85 | 2.61 | 0.98 | 2400.00 | 0.00 |
| p2 | Target | Avg_Watts | Avg_Volts | Avg_Amps | Avg_PF | Samples | UnCert% |
| ptd0 | SERVER | 696.84 | 208.78 | 3.34 | 1.00 | 2400.00 | 0.00 |
| ptd1 | SERVER | 702.42 | 216.44 | 3.25 | 1.00 | 2400.00 | 0.00 |
| ptd2 | EXT_STOR | 553.61 | 213.43 | 2.64 | 0.98 | 2400.00 | 0.00 |
| Summary | | Run_Is_Compliant | | | | Turbo_Setting:0 | |
| | | Number_Of_Compliance_Issues(0)* | | | | Median_Phase(p1) | |
| Unreviewed_VMmark2_Avg_Watts | | 1947.46 | | | | | |
| Unreviewed_VMmark2_Applications_Score | | 30.63 | | | | | |
| Unreviewed_VMmark2_Infrastructure_Score | | 1.21 | | | | | |
| Unreviewed_VMmark2_Score | | 24.74 | | | | | |
| Unreviewed_VMmark2_PPKW | | 12.7058 | | | | | |

Configuration

| PTD Configuration | |
|--|----------------------------|
| Number of Power Meters | 3 |
| Power Meter Vendors and Models | Voltech PM1000+ |
| Power Meter PTD Target(s) (SERVER/EXT_STOR) | 2 x SERVER 1 x EXT_STOR |
| Power Meter Connection Type(s) (Eth/GPIB/Serial/USB) | Serial |

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|---|--|
| Power Meter Calibration Date(s) (MM-DD-YYYY) | 03-06-2014 |
| Power Meter Calibration Info (Calibrated By/Duration) | HP Metrology / 03-06-2015 |
| Power Meter(s) Volt/Amp Range | 215.0 Volts / 4.0 Amps |
| PTD Client Configuration | |
| Number of Power Meter Clients | 1 |
| System Model(s) | HP ProLiant DL360 G5 |
| Processor Vendor(s) and Model(s) | Intel Xeon X5160 |
| Processor Speed(s) (GHz) | 3.00 |
| Total Sockets/Total Cores/Total Threads | 2 Sockets / 4 Cores / 4 Threads |
| Memory Per Power Meter Client | 8 GB |
| Network Controller(s) Vendors and Models | 1 x HP NC373i embedded Dual Port Gigabit Adapter |
| Operating System, Version, and Service Pack | Microsoft® Windows® 2008 R2 (64-bit) |
| Other Hardware | 1 x AmazonBasics 4-port USB 2.0 ultra-mini hub 3 x IOGear USB-to-serial adapter (GUC232A) |
| Other Software | None |

Configuration

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|---|---|
| Virtualization Software | |
| Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY) | VMware ESXi 5.5.0 U2 Build 1909291/ 09-09-2014 |
| Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY) | VMware vCenter Server 5.5.0 U2 Build 1909363 / 09-09-2014 |
| Supplemental Software | none |
| Servers | |
| Quantity | 2 |
| Server Manufacturer and Model | HP ProLiant DL380 Gen9 |
| Processor Vendor and Model | Intel Xeon E5-2699 v3 |
| Processor Speed (GHz) | 2.30 |
| Total Sockets/Total Cores/Total Threads | 2 Sockets / 36 Cores / 72 Threads |
| Primary Cache | 32 KB I + 32 KB D on chip per core |
| Secondary Cache | 256 KB I+D on chip per core |

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|---|---|
| Other Cache | 45 MB I+D on chip per chip L3 |
| BIOS Version | P89 07/11/2014 |
| Memory Size (in GB, Number of DIMMs) | 512 GB, 16 x 32 GB DIMMs |
| Memory Type and Speed | Quad Rank PC4-2133 ECC DDR4 2133 MHz LRDIMM |
| Disk Subsystem Type | FC SAN |
| Number of Disk Controllers | 1 |
| Disk Controller Vendors and Models | HP Smart Array P440ar |
| Number of Host Bus Adapters | 2 |
| Host Bus Adapter Vendors and Models | HP SN1000Q PCIe dual port 16Gb Fibre HBA |
| Number of Network Controllers | 2 |
| Network Controller Vendors and Models | 1 x HP Ethernet 1 Gb 4-port 331FLR Adapter, 1 x HP Ethernet 10Gb 2-port 560SFP+ Adapter |
| Other Hardware | none |
| Other Software | none |
| Hardware Availability Date (MM-DD-YYYY) | 09-09-2014 |
| Software Availability Date (MM-DD-YYYY) | 09-15-2014 |
| Network | |
| Network Switch Vendors and Models | 1 x H3C S5820X-28S |
| Network Speed | H3C S5820X-28S - 24 x 10 GbE ports, 4 x 1 GbE ports |
| Storage | |
| Array Vendors, Models, and Firmware Versions | SanDisk ION Accelerator, FW 2.5.0 |
| Fibre Channel Switch Vendors and Models | HP SN3000B 16Gb 24-port Fibre Channel Switch |
| Disk Space Used | 7.8 TB |
| Array Cache Size | N/A |
| Total Number of Physical Disks Used | 6 (2 per SUT OS, 2 for SanDisk ION OS), 3 x PCI-e Flash |
| Total Number of Enclosures/Pods/Shelves Used | 1 |
| Number of Physical Disks Used per Enclosure/Pod/Shelf | Internal: 2 disks per host Enclosure: 2 disks for SanDisk ION OS, 3 x PCI-e Flash |

| | |
|--------------------------------------|---|
| Total Number of Storage Groups Used | 0 |
| Number of LUNs Used | 14 |
| LUN Size and Number of Disks Per LUN | All LUNs spread across 3 x HP PCIe Workload Accelerator cards under the control of the SanDisk ION Accelerator 12 LUNs: 600 GB 1 LUN: 200 GB 1 LUN: 100 GB |
| RAID Type | RAID 0 for enclosure, RAID 1 for OS drives |
| Number of Members per RAID Set | RAID 0: 3 RAID 1: 2 |
| Disk Vendors, Models, and Speeds | 6 x HP 146GB 15K RPM SAS SFF (P/N 652605-B21) 3 x HP 2.6 TB HH/HL Light Endurance (LE) PCIe Workload Accelerator (P/N 775670-B21) |

Datacenter Management Server

| | |
|--|--|
| System Model | HP ProLiant BL685c G7 |
| Processor Vendor and Model | AMD Opteron(TM) Processor 6380 |
| Processor Speed (GHz) | 2.5 |
| Total Sockets/Total Cores/Total Threads | 4 Sockets / 64 Cores / 64 Threads |
| Memory | 256 GB |
| Network Controller(s) Vendors and Models | 1 x HP NC551i Dual Port FlexFabric 10GbE Adapter |
| Operating System, Version, Bitness, and Service Pack | VMware ESXi 5.1.0 U2 Build 1483097 |
| Other Hardware | none |
| Other Software | Microsoft® Windows® 2008 R2 Enterprise (64-bit) |

Clients

| | |
|---|---|
| Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts | 21 / 1 / 4 |
| System Model(s) | HP ProLiant DL360 G5 (prime client) Virtual Client Hosts: HP ProLiant BL465c G7 (virtual client hosts) |
| Processor Vendor(s) and Model(s) | Prime client: Intel Xeon X5160 Virtual Client Hosts: AMD Opteron 6174 |
| Processor Speed(s) (GHz) | Prime Client: 3.00 Virtual Client Hosts: 2.2 |
| Total Sockets/Total Cores/Total Threads | Prime Client: 2 Sockets / 4 Cores / 4 Threads Virtual Client Hosts: 2 Sockets / 24 Cores / 24 Threads |
| Memory per Physical Client | Prime Client: 8 GB Virtual Client Hosts: 64 GB |

| | |
|---|---|
| Network Controller(s) Vendors and Models | Prime Client: 1 x HP NC373i embedded Dual Port Gigabit Adapter Virtual Client Hosts: 1 x HP NC551i Dual Port FlexFabric 10GbE Adapter, 1 x HP NC542m Dual Port Flex-10 10GbE BL-c Adapter |
| Operating System, Version, Bitness, and Service Pack | Prime Client: Microsoft® Windows® 2008 R2 (64-bit) Virtual Client Hosts: VMware ESXi 5.1 U2 (Build 1483097) |
| Number of Virtual Clients | 20 |
| Number of vCPUs Per Virtual Client | 4 |
| Number of vMem (GB) Per Virtual Client | 4 |
| Virtual Client Networking Notes | none |
| Virtual Client Storage Notes | Details in Client Notes section |
| Other Hardware | 4 x HP QMH2562 8 Gb Dual Port Fibre Channel HBA (1 per virtual client host) 1 x HP BladeSystem c7000 Enclosure 4 x HP Virtual Connect Flex-10 10Gb Ethernet Module 4 x HP B-series 8/24c 24 port 8 Gb SAN Switch 4 x HP P2000 G3 FC MSA storage enclosure 96 x 146 GB 15K SFF SAS disk drive |
| Other Software | HP BladeSystem c7000 Onboard Administrator Version 4.00, HP Virtual Connect Manager Version 4.10 |

Notes for Workload

Virtualization Software Notes

- All VMs used virtual hardware V7
- All VMs (except for Deploy Template) had VMware tools version 8305 installed and running
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- Logging was disabled for all VMs (default enabled)
- CD & floppy devices were removed on all VMs (default enabled)
- All VMs besides standbys: Paravirtual Controller
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 2
- Logical CPU layout changed for all multi-cpu VMs to 1 socket with multiple cores. (default Single core per socket)
- All DS2DB VMs had CPU shares set to High (default Normal)
- ethernet0.coalescingScheme = static for all OlioWeb VMs

Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.CreditAgePeriod = 1000 (default 3000)
- Cpu.HTWholeCoreThreshold = 0 (default 200)
- DataMover.HardwareAcceleratedInit = 0 (default 1)
- DataMover.HardwareAcceleratedMove = 0 (default 1)
- Irq.BestVcpuRouting = 1 (default 0)

- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)
- Net.MaxNetifRxQueueLen =500 (default 100)
- Net.MaxNetifTxQueueLen =1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Net.NetTxWorldlet = 1 (default 2)
- Numa.LargeInterleave = 0 (default 1)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.MigImbalanceThreshold = 57 (default 10)
- Numa.MonMigEnable = 0 (default 1)
- Numa.PageMigEnable = 0 (default 1)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapInterval = 1 (default 3)
- Numa.SwapLoadEnable =0 (default 1)
- Numa.SwapLocalityEnable =0 (default 1)
- VMFS3.HardwareAcceleratedLocking =0 (default 1)

Driver Options:

- /vmkernel/module/qlnativefc/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=2 ql2xenablesix=1"
- The VMkernel limit for all the LUNs was set to 256.

Server OS (ESXi 5.5 U2 build 190921) was installed using HP-ESXi-5.5.0-Update2-iso-5.76.30 ISO, which was preloaded with HP device drivers. No driver upgrades were made after the OS was installed.

Server Notes

Server BIOS settings:

- HP Power Profile set to Maximum Performance (default: Balanced Power and Performance)
- Thermal Configuration set to Maximum Cooling (default: Optimal Cooling)
- HW Prefetcher set to Disabled (default: Enabled)
- Adjacent Sector Prefetcher set to Disabled (default: Enabled)
- QPI mode Early Snoop (default: Home Snoop)
- Memory Refresh Rate set to 1x Refresh (default: 2x Refresh)
- Intel Turbo Boost Enabled (frequency boost to 3.6 GHz) (default Enabled)

Networking Notes

- vSwitch0 for the Service Console on vmnic0 at 1Gb/s
- vSwitch1 defined as VMkernel vMotion connection on vmnic1 at 1Gb/s
- vSwitch2 for the DVD store workload on vmnic4 at 10Gb/s
- vSwitch3 for the Olio workload on vmnic5 at 10Gb/s
- vSwitch4 for the Mail server workload on vmnic2 at 1Gb
- vSwitch5 for the standby and deploy workloads on vmnic3 at 1Gb/s

Storage Notes

- ESXi was installed on two disks configured as RAID1 in the internal server storage bay on each SUT
- All LUNs were spread across three HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator cards in RAID0 within a single HP ProLiant DL380p Gen8 running SanDisk ION Accelerator software
- Physical Configuration for SanDisk ION Accelerator:
 - HP ProLiant DL380p Gen8
 - 2 x Intel Xeon E5-2680 2.90 GHz processors
 - 128 GB (16 x 8 GB DIMMs dual rank PC3-12800 Registered DDR3)
 - 3 x HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator cards configured in RAID0
 - 2 x HP SN1000Q dual port 16 Gb fibre HBAs
 - 1 x HP Smart Array 420i controller for ION OS
 - 2 x 146 GB 15k RPM SAS SFF for ION OS
- Software Configuration for SanDisk ION Accelerator:
 - 12 LUNs at 600 GB
 - 8 LUNs had all VMs from 2 tiles (except for standby VM)
 - 4 LUNs had all VMs from 1 tile (except for standby VM)
 - 1 LUN at 200 GB
 - All standby VMs and the deploy template
 - 1 LUN at 100 GB
 - Used for deploy target and sVmotion target

Datacenter Management Server Notes

- HP ProLiant BL685c G7 running ESXi 5.1.0 U2 Build 1483097 with one virtual machine for vCenter for SUT
 - vCenter for SUT
 - 2 virtual CPUs
 - 8 GB virtual memory
 - Microsoft® Windows® 2008 R2 Enterprise (64-bit)

Operating System Notes

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise (64-bit)
 - Microsoft Exchange System Attendant not running on mailservers 8 & 13
- All standby VMs running Microsoft® Windows® 2003 Enterprise SP2 (32-bit)
- All DS2DB, DS2WebA, DS2WebB, DS2WebC, OlioDB and OlioWeb running SUSE® Linux Enterprise Server 11 SP2 (64-bit)

Software Notes

- Microsoft® Exchange Server 2007 Enterprise SP3 (64-bit) was installed on each mailserver VM

Client Notes

- Prime client functionality was split from the client0 driver and was run on a non-virtualized copy of Microsoft® Windows® 2008 R2 Enterprise (64-bit).
- Prime client was running VMware vSphere PowerCLI 5.5 Release 2 build 1671586
- Prime client had the following storage configuration
 - 2 x 72 GB 15K SFF disk drives for OS
 - 2 x 300 GB 10K SFF disk drives for extra storage capacity

- All PTDs were run from the prime client
- All power meters were connected to the prime client
- All client drivers were run on virtual machines that were each defined with 4 virtual CPUs, 4 GB of memory, 1 vmxnet2 network and 32 GB of disk space.
- Four HP ProLiant BL465c G7 hosted 20 virtual machines combined as follows:
 - system 1: hosted vclients 0,4,8,12,16
 - system 2: hosted vclients 1,5,9,13,17
 - system 3: hosted vclients 2,6,10,14,18
 - system 4: hosted vclients 3,7,11,15,19
- All client operating systems were updated via Windows Update.
 - Application Experience was running on only clients 0 & 2
 - SPP Notification Service was running only on clients 14-17.
 - Software Protection was running only on clients 14-17
- Virtual client hosts were configured to use a fibre attached storage that was separate from the storage used by the SUT hosts.
 - 1 x HP QMH2562 8 Gb Dual Port Fibre Channel HBA per virtual client host
 - 4 x HP B-series 8/24c 24 port 8 Gb SAN Switch
 - 4 x HP P2000 G3 FC MSA storage enclosure
 - 96 x 146 GB 15K SFF SAS disk drives for client virtual machines
 - 2 x 146 GB 15K SFF SAS disk drives in internal drive bays for virtual client host OS

Other Notes

None

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