GVP HSG Pages

MP3 16kbps Bit Rate Compression

5/14/2025

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Support for MP3 16 kbps bit rate recording compression began with The GVP 8.5.1 release in December 2014. We tested performance on physical server and Virtual Machine (VM) environments, using Windows 2008 R2 x64.

Physical Server on Single Hex Core

Testing was performed on Hardware Profile 1: a physical server on a single hex core of Dell R410. The three graphs below compare system CPU usage and audio quality related metrics, max jitter and max delta.

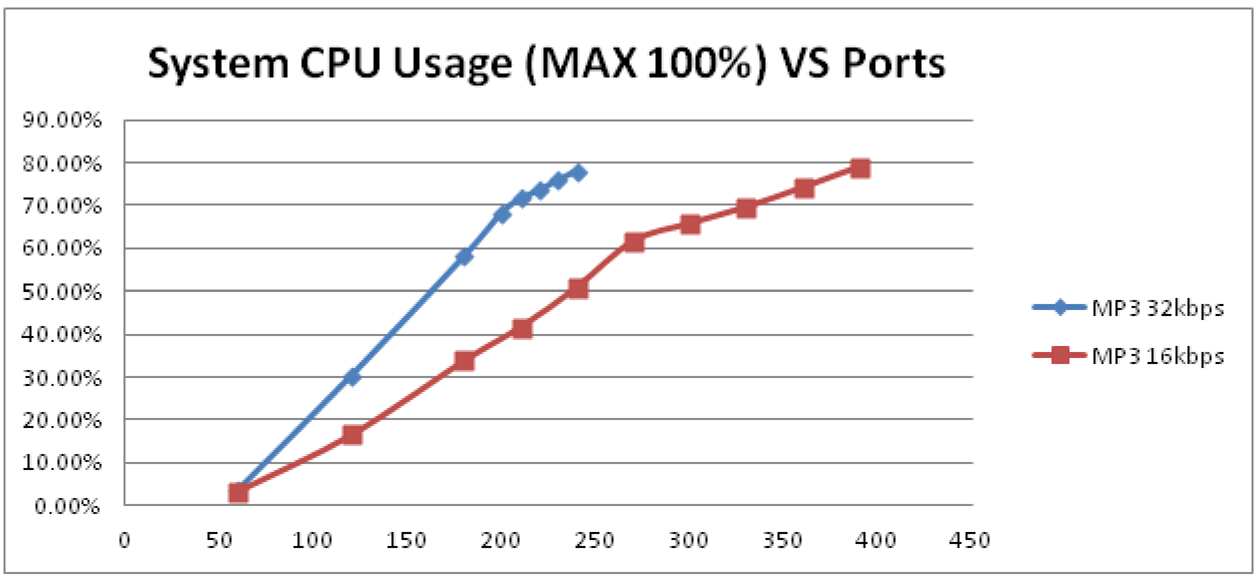

Figure 42: Comparison of System CPU Usage, MP3 16kbps vs 32kbps on Physical Server

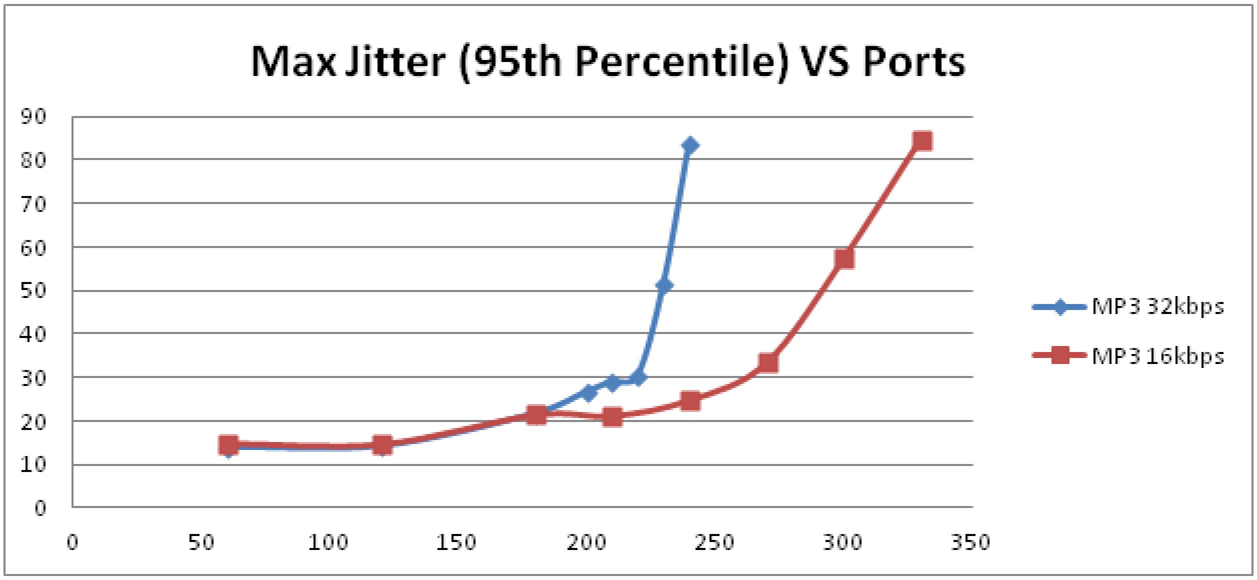

Figure 43: Comparison of Max Jitter, MP3 16kbps vs 32kbps on Physical Server

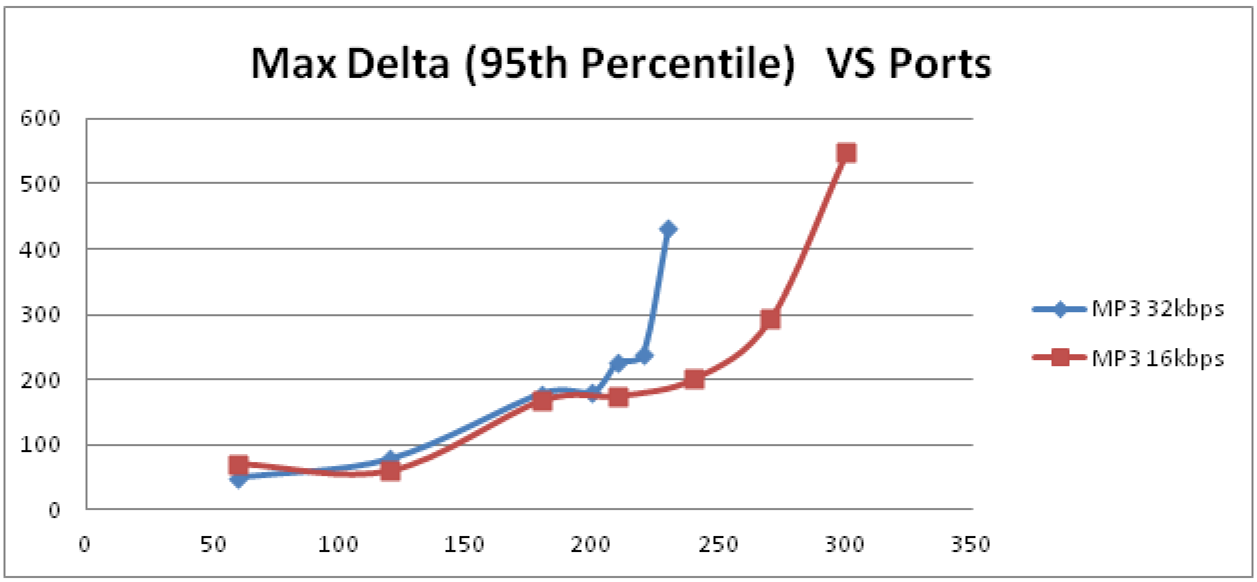

Figure 44: Comparison of Max Delta MP3 16kbps vs 32kbps on a Physical Server

MP3 16kbps consumes less CPU memory, which means higher port capacity. The two graphs above that compare Max Jitter with Max Delta also indicate the higher port capacity of MP3 16kbps. Recommended port capacity for MP3 16kbps: 240 ports (20% higher than the 200 recommended port capacity for MP3 32kbps). Peak port capacity: 270 ports (22.7% higher than the 220 peak port capacity for MP3 32kbps).

The table below lists the system disk IOPS:

Figure 45: System Disk IOPS on Physical Server, MP3 only 16 Kbps

Ports	Physical Server Disk IOPS (kbps)		
Total	Reads	Writes	
60	14.66	0.036	14.62
120	24.00	0.041	23.95
180	33.42	0.029	33.39
210	37.65	0.030	37.62
240	42.21	0.029	42.18
270	47.18	0.036	47.14
300	51.44	0.011	51.43
330	55.81	0.006	55.81
360	60.99	0.002	60.99
390	67.12	0.003	67.11

The graph below compares Table: System Disk IOPS on Physical Server, MP3 only 16 Kbps with Table: Disk IOPS of system level from a physical server with a single hex core, both on a single hex core server:

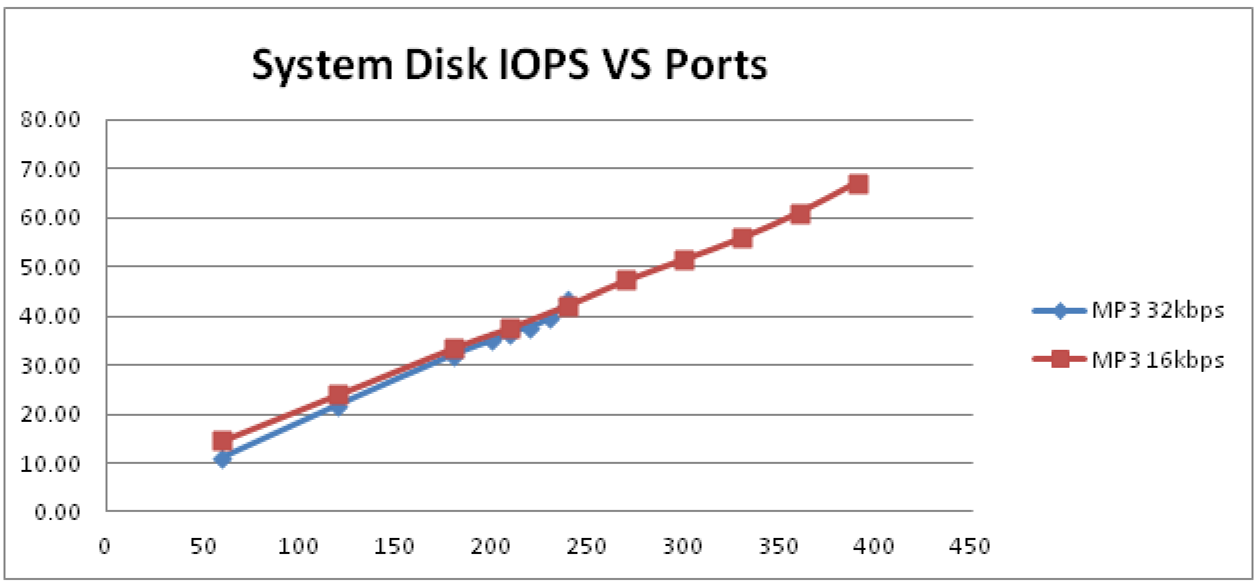

Figure 46: Comparison of System Disk IOPS on Single Hex Core Physical Server, MP3 16 Kbps vs 32 Kbps

The system disk IOPS for MP3 16kbps and 32kbps are nearly identical to each other; reasonable since the disk IO operations should be the same, and at the same port capacity, no matter which MP3 bit rate is chosen.

MCP IOPS is listed here:

Figure 47: MCP IOPS on physical server of single hex core, MP3 only, 16 Kbps

Ports	Physical Server MCP IOPS (kbps)		
Total	Reads	Writes	
60	14.56	7.53	7.04
120	28.64	14.92	13.72
180	42.54	22.29	20.25
210	49.42	25.93	23.48
240	56.41	29.64	26.76
270	63.38	33.34	30.04
300	70.36	36.92	33.44
330	77.53	40.79	36.74
360	85.52	44.46	41.06
390	94.68	48.14	46.54

The graph below compares Table: MCP IOPS on physical server of single hex core, MP3 only, 16 Kbps and Table: MCP IOPS on physical server of single hex core, MP3 only:

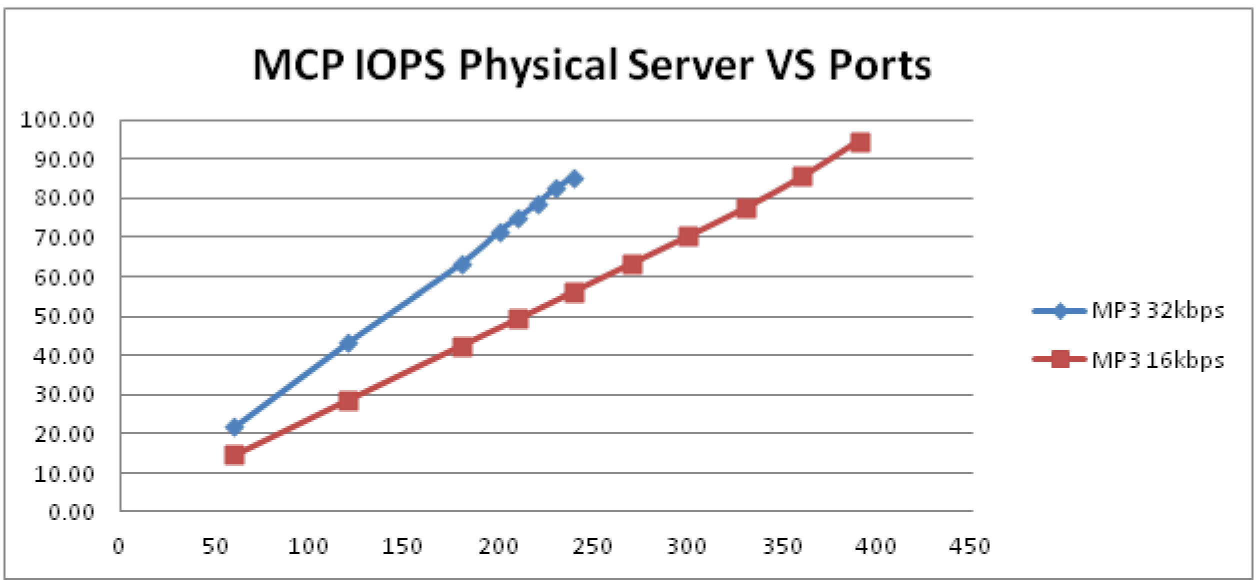

Figure 48: MCP IOPS on Single Hex Core Physical Server, MP3 16Kbps vs 32Kbps

MP3 16kbps uses less IOPS at the process level, probably be due to fewer network operations for MP3 16kbps.

VMs on Dual Hex Cores Server

The testing for MP3 16kbps was conducted on VM Profile 4 (based on Hardware Profile 4, which is a dual hex cores server). 6 VMs were configured, while only one MCP was installed on each Windows VM. The three graphs below compare overall CPU usage, audio quality related max jitter and max delta for MP3 16kbps vs 32kbps:

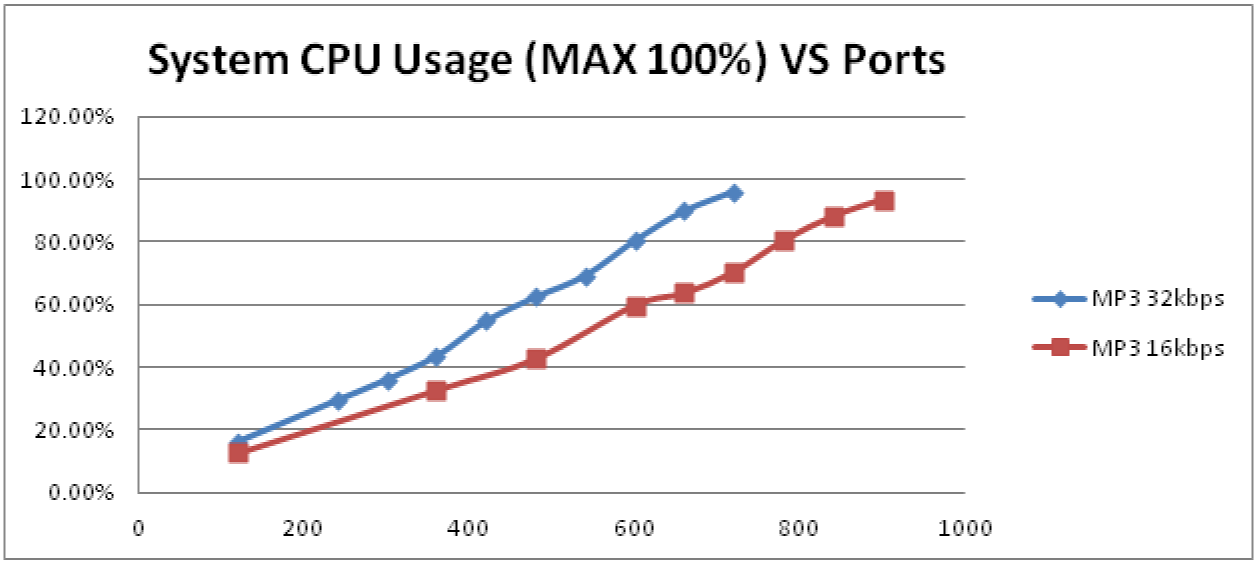

Figure 49: Comparison System CPU Usage of MP3 16kbps vs 32kbps on VM env

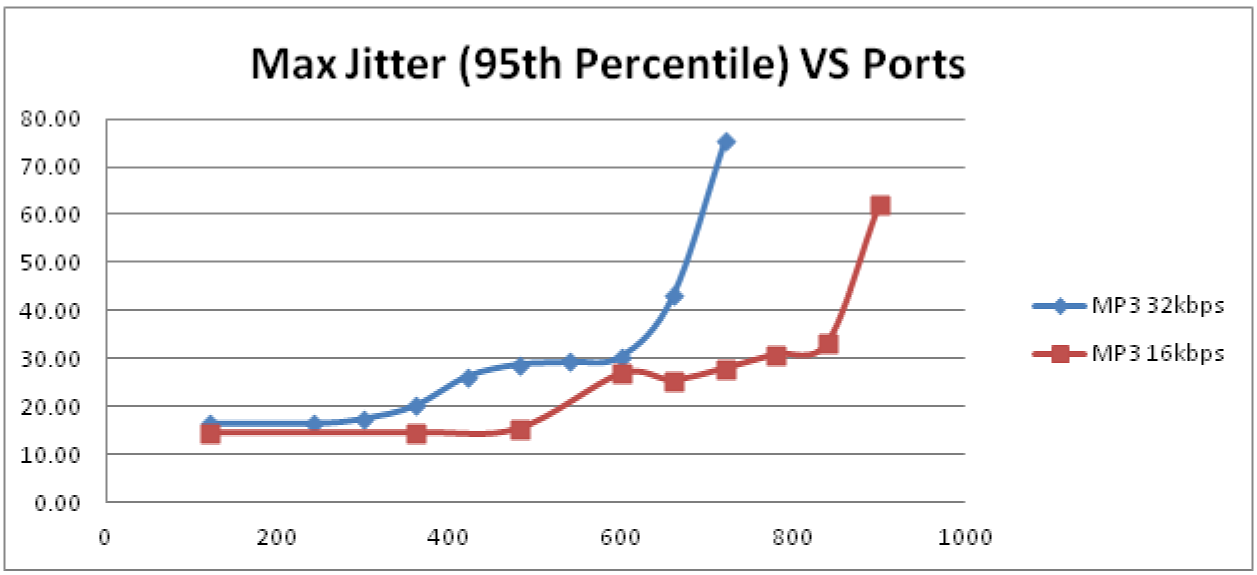

Figure 50: Comparison of Max Jitter, MP3 16kbps vs 32kbps on VM env

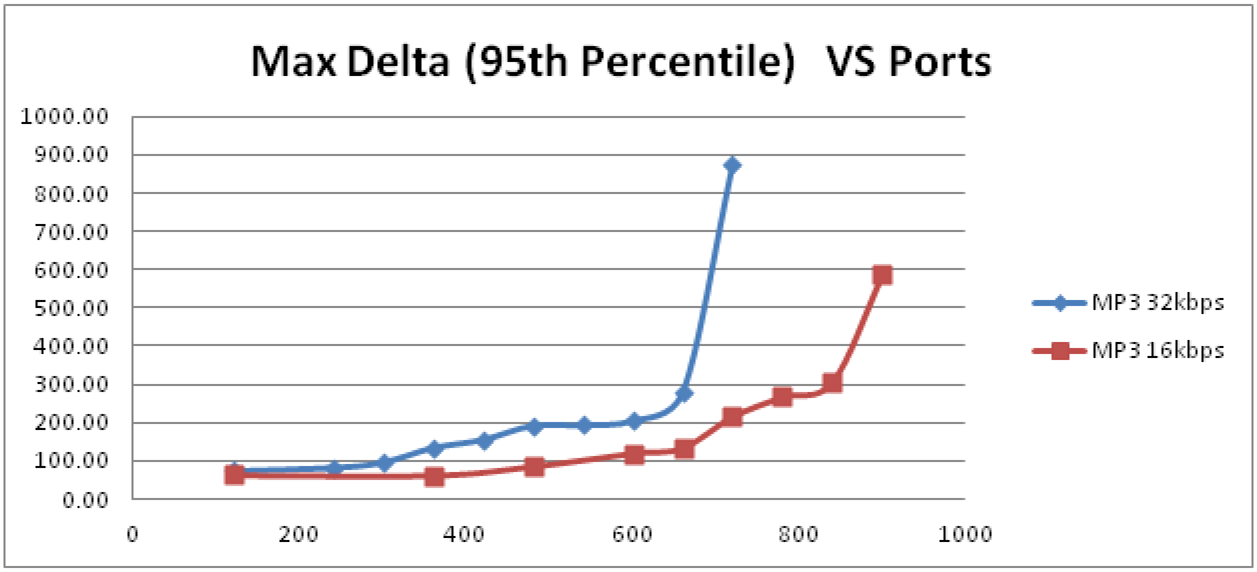

Figure 51: Comparison of Max Delta, MP3 16kbps vs 32kbps on VM environment

MP3 16kbps consumes less CPU memory, which matches test results on a physical server in Figure: Comparison of System CPU Usage, MP3 16kbps vs 32kbps on Physical Server. Both Max Jitter and Max Delta also show a higher port capacity for MP3 16kbps compression, which also matches test results on a physical server from Figure 4: Comparison of Max Jitter, MP3 16kbps vs 32kbps on Physical Server & Figure: Comparison of Max Delta MP3 16kbps vs 32kbps on a Physical Server. Preferred/Recommended port capacity for MP3 16 kbps: 720 ports (20% higher 600 ports for than MP3 32kbps). It’s the same increase as observed from a physical server. Peak port capacity for MP3 16kpbs can be as high as 840 ports (27.3% higher than 660 peak port capacity for MP3 32kbps.

The table below illustrates system disk IOPS:

Figure 52: Overall Disk IOPS on all 6 VMs of dual hex cores, MP3 only, 16 Kbps

Ports	Overall 6 VMs Disk IOPS (kbps)		
Total	Reads	Writes	
120	26.57	0.13	26.44
360	63.47	0.13	63.34
480	80.66	0.15	80.51
600	93.73	0.04	93.69
660	109.53	0.14	109.39
720	118.76	0.13	118.62
780	126.15	0.07	126.08
840	134.12	0.04	134.09
900	142.21	0.09	142.12

The graph below compares overall disk IOPS of all 6 VMs for MP3 16kpbs against 32kbps in Table: Disk IOPS of sum of all 6 VMs of dual hex cores, MP3 only':

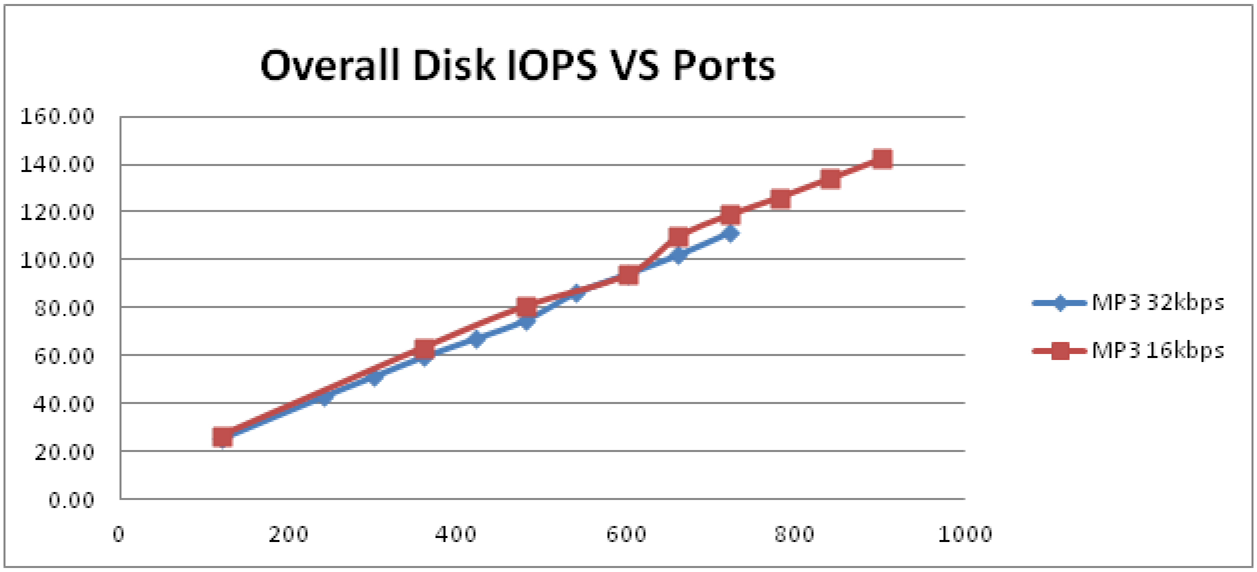

Figure 53: Comparison of Overall 6 VMs Disk IOPS MP3 16 kbps vs 32 kbps

The IOPS from both MP3 16kbps and 32kbps are inline with each other, as in the physical server tests.

Data throughput for MP3 16kbps is listed in following table:

Figure 54: Data Throughputs for MP3 only, 16 kbps

Ports	Overall Disk (kbps)			SSD Drive Disk (kbps)		
Total	**Reads**	**Writes**	**Total**	**Reads**	**Writes**	
120	318.17	0.68	317.49	296.313	0.001	296.312
360	892.94	0.52	892.42	856.077	0.001	856.076
480	1175.63	0.79	1174.84	1132.997	0.001	1132.996
600	1537.43	0.19	1537.23	1510.543	0.000	1510.543
660	1729.45	0.58	1728.87	1680.374	0.003	1680.371
720	1890.48	0.58	1889.90	1837.492	0.000	1837.492
780	2045.34	0.35	2045.00	1995.239	0.004	1995.235
840	2191.98	0.15	2191.83	2142.373	0.002	2142.371
900	2349.18	0.75	2348.44	2298.426	0.004	2298.422

Using this formula:
`MP3 bitrate * Ports / 8 = kbps`
...where MP3 bitrate=16kbps and Ports = `120` and `720` from the table above,

The results...
`16 kpbs * 120 / 8 = 240 kbps` (compared to 296 in the table -- in SSD)
and
`16 kpbs * 720 / 8 = 14400 kbps` (compared to 1837 in the table -- in SSD)

...from real testing for MP3 16kbps are slightly higher than calculations predict, due to other files such as metadata and JSON files being saved in the same cache folder. So the formula still stands.

The following table lists MCP IOPS:

Figure 55: Overall MCP IOPS from 6 VMs of dual hex core, MP3 only, 16kbps

Ports	Overall 6 VMs MCP IOPS (kbps)		
Total	Reads	Writes	
120	28.931	14.915	14.016
360	86.517	44.456	42.061
480	114.574	59.153	55.421
600	142.112	73.730	68.382
660	156.495	81.359	75.136
720	170.237	88.660	81.577
780	184.173	96.048	88.125
840	197.767	103.263	94.504
900	211.644	110.545	101.099

The graph below compares Overall MCP IOPS with MP3 32k MCP IOPS, and shows the same trend of physical server results that appeared in Figure: MCP IOPS on Single Hex Core Physical Server, MP3 16Kbps vs 32Kbps:

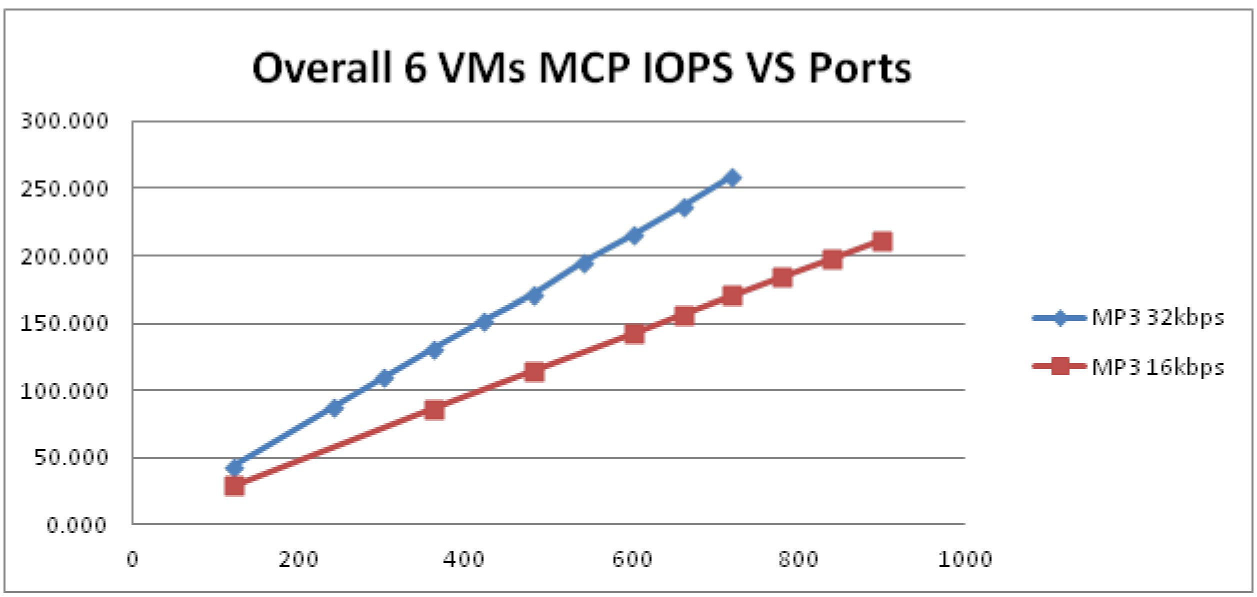

Figure 56: MCP IOPS on 6 VMs of Dual Hex Cores, MP3 16Kbps vs 32Kbps