GVP HSG Pages

Performance Comparison of Physical Server and Virtual Machines

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Single Hex Core

With a single hex core CPU, Genesys recommends 200 ports as a reasonable peak port capacity on a physical server with a single X5670, assuming that all criteria have been met. 300 ports can be achieved with a three-VMs configuration of the same hardware, with a single X5675 (performance is slightly better than X5670). The graph below compares overall CPU usage:

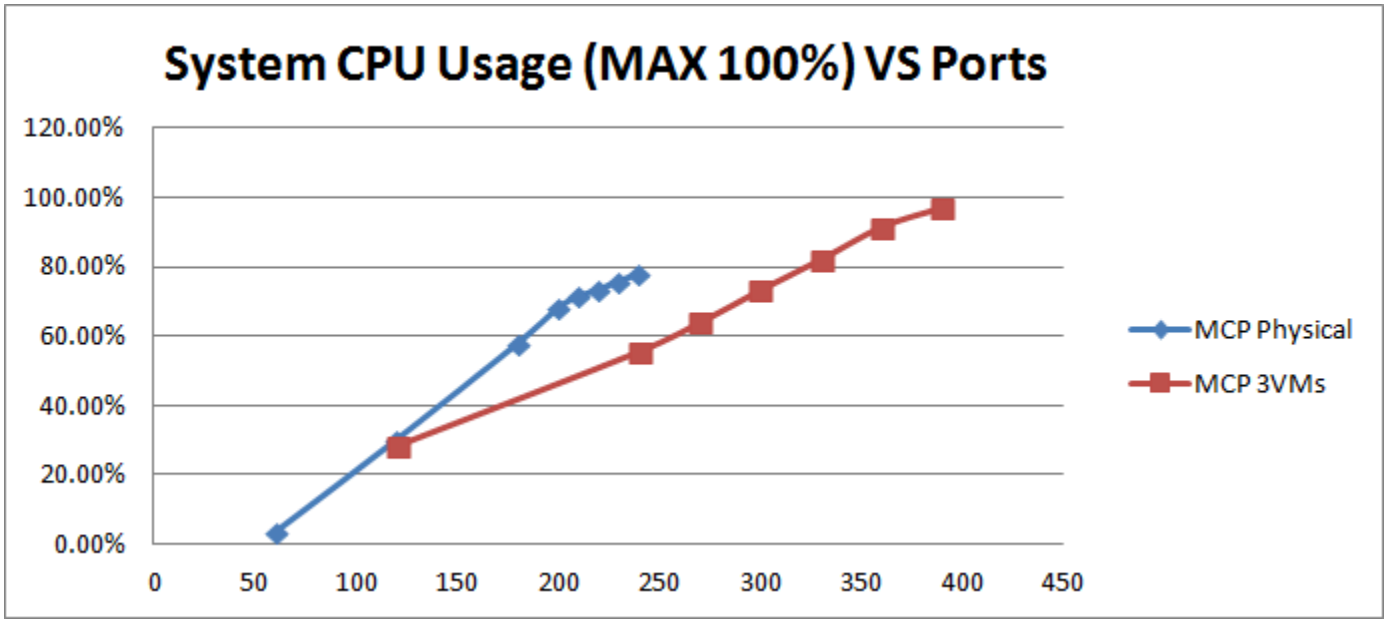

Figure 1: Comparison of System Usage between Physical Server and VM from Single Hex Core

Memory usage for MCP scales linearly against port capacity:

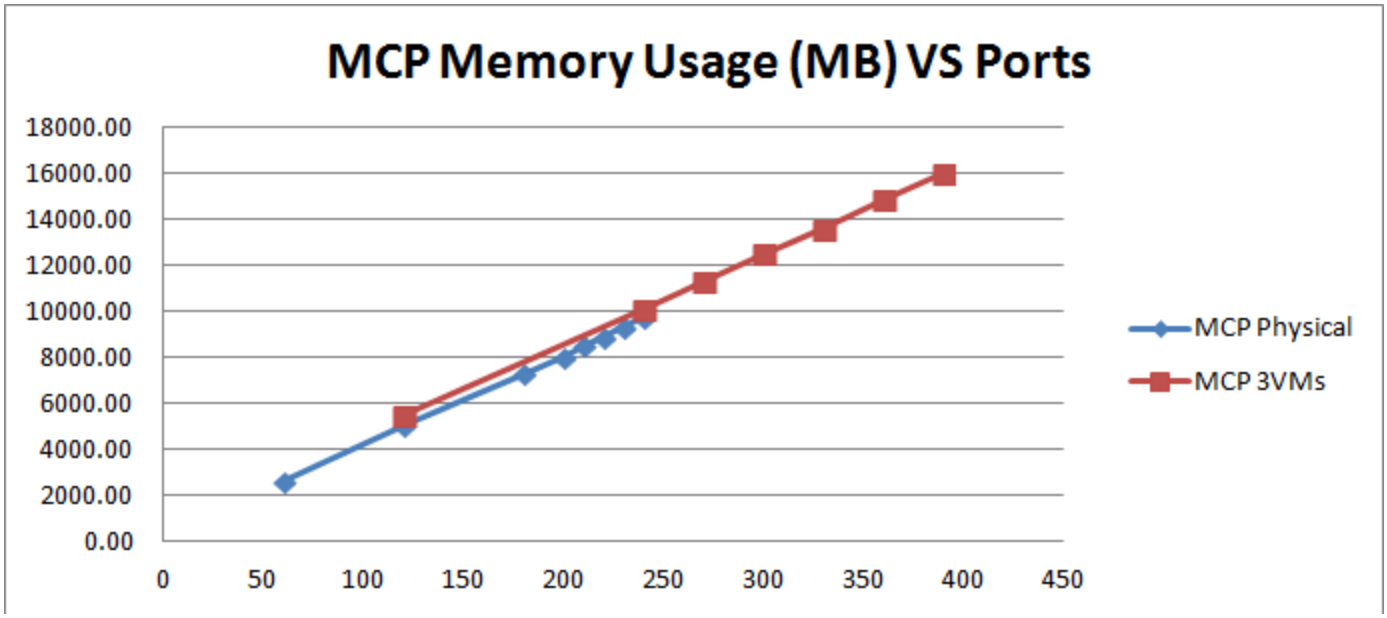

Figure 2: Comparison of MCP Memory Usage between Physical Server and VM from Single Hex Core

The two graphs below compare the 95th percentile value of Max Jitter Buffer and Max Delta, tracking audio quality from a sample RTP stream:

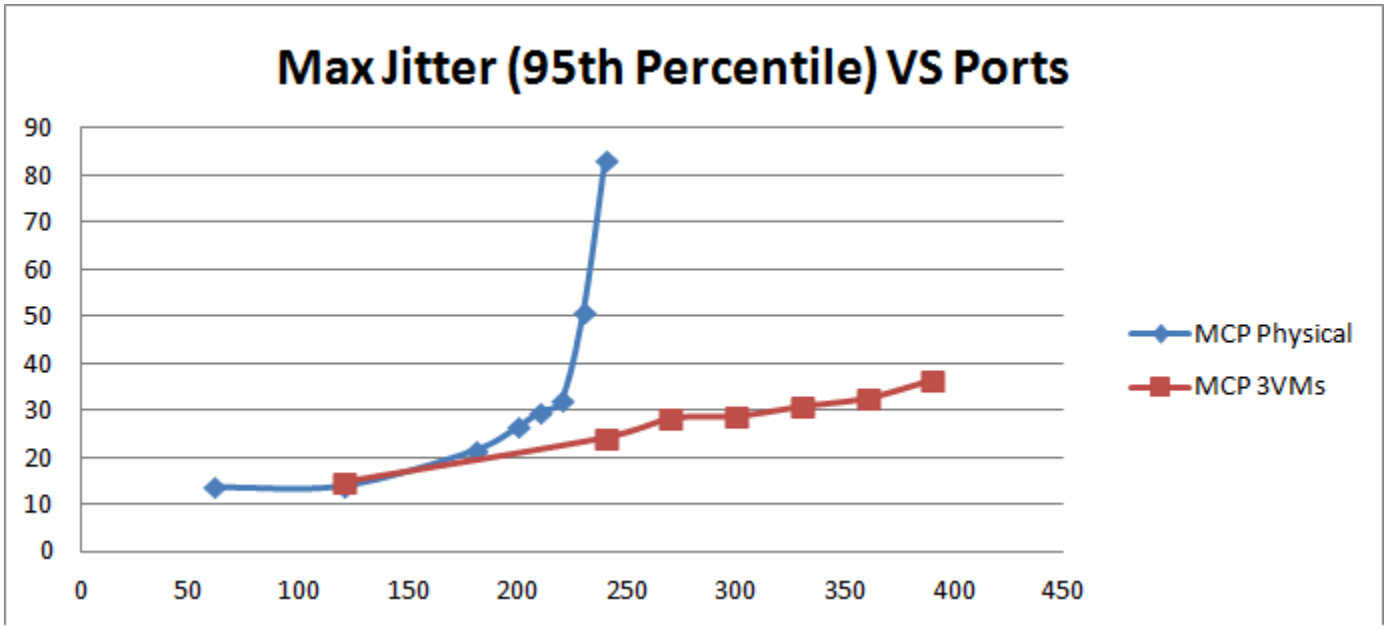

Figure 3: Comparison of Max Jitter between Physical Server and VM from Single Hex Core

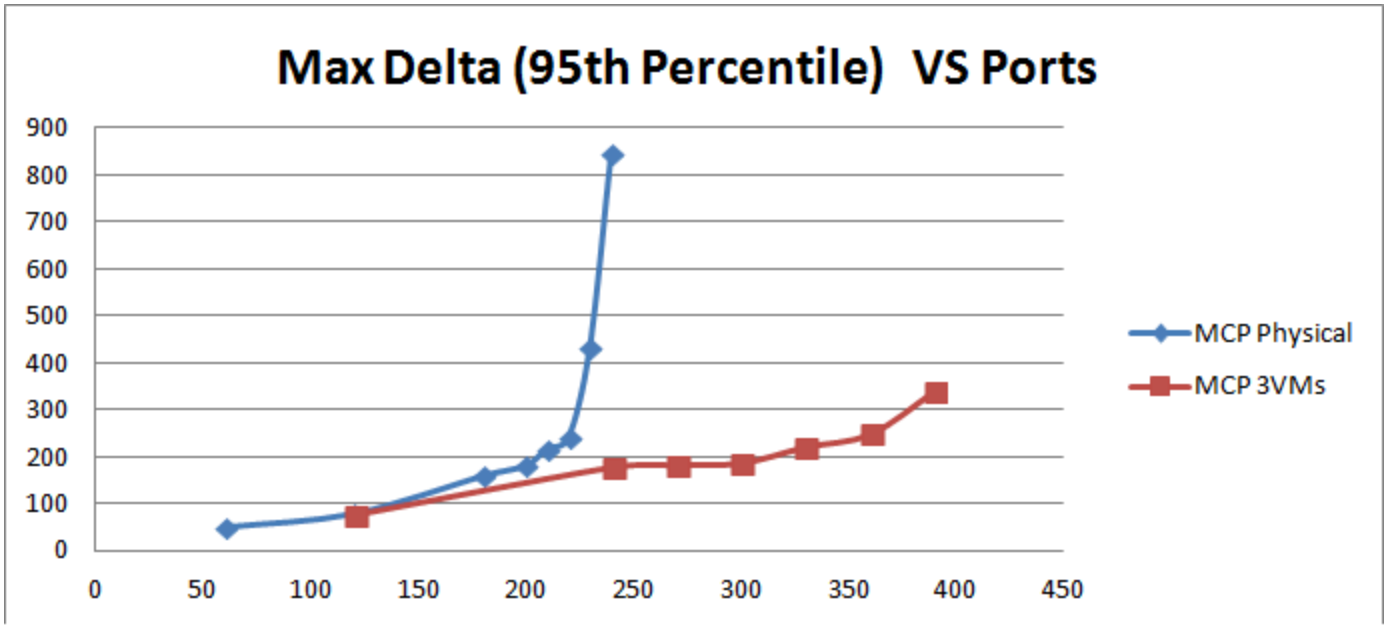

Figure 4: Comparison of Max Delta between Physical Server and VM from Single Hex Core

A strong correlation exists between Max Jitter Buffer and Max Delta, regarding audio quality. A physical server can meet all criteria when its port capacity is 200 or below. Port capacity that is between 200 and 220 may impact audio quality, since both Max Jitter buffer and Max Delta are just slightly beyond the passing criteria. You can consider 220 as peak performance, if audio quality is not strictly required and can be waived. However, when port capacity reaches 230 or beyond, the two values become so big that there is apparent audio quality impact.

For VM configuration: Preferred/Recommended = 300 ports; Peak Port Capacity = 360 ports. With 390 ports, overall system CPU usage is 97%, close enough to 100% that it also observed audio quality impact.

Below are two tables of IOPS for the above two configurations:

Table 1: Disk IOPS of system level from a physical server with a single hex core

Ports	Disk IOPS Physical Server		
Total	Reads	Writes	
60	11.13	0.001	11.13
120	21.82	0.001	21.82
180	32.03	0.001	32.03
200	34.95	0.001	34.95
210	36.53	0.001	36.53
220	37.76	0.001	37.76
230	39.48	0.001	39.48
240	43.33	0.002	43.33

Table 2: Disk IOPS of sum of all VMs of single hex core

Ports	Disk IOPS VMs Overall		
Total	Reads	Writes	
120	20.68	0.101	20.58
240	36.29	0.070	36.22
270	41.39	0.087	41.30
300	45.57	0.065	45.50
330	48.85	0.000	48.85
360	51.69	0.000	51.69
390	57.82	0.002	57.82

Disk IOPS in Disk IOPS of sum of all VMs of single hex core table is the sum of Disk IOPS from all VMs. Also, IOPS is measured from each VM and then totaled, to determine overall IOPS. The same method is applied to all Disk IO calculations for VM environments in this series of tests.

Also in the above two tables, the IOPS Reads value is quite small because most of the operations are Writes.

The graph below compares the two IOPS tables above:

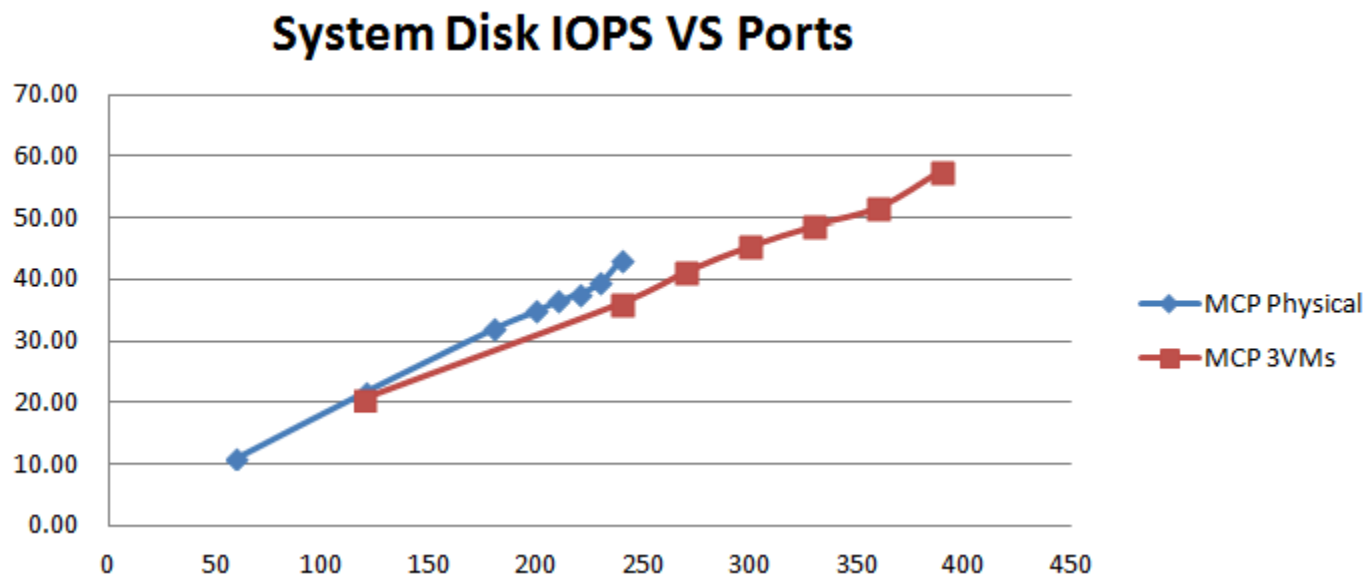

Figure 5: Comparison of System Disk IOPS Physical Server and VM from Single Hex Core

- System level disk IOPS is scaling linearly against port capacity for both physical server and virtual machines.
- SSD is only used on VM env as cache folder of MCP recording while SAS HDD drive is used to installed OS and MCP.

Dual Hex Cores

With a host of dual hex core CPUs (2x X5675@3.06GHz) with 32 GB RAM, we also compare the results from physical server and VM env. In VM env, on same hardware spec, 3 VMs are configured with 4 vCPU and 8 GB RAM assigned to each VM. Only one MCP installed on each VM and a SSD partition is used as cache folder for MCP recording.

The graph below depicts the overall system CPU usage:

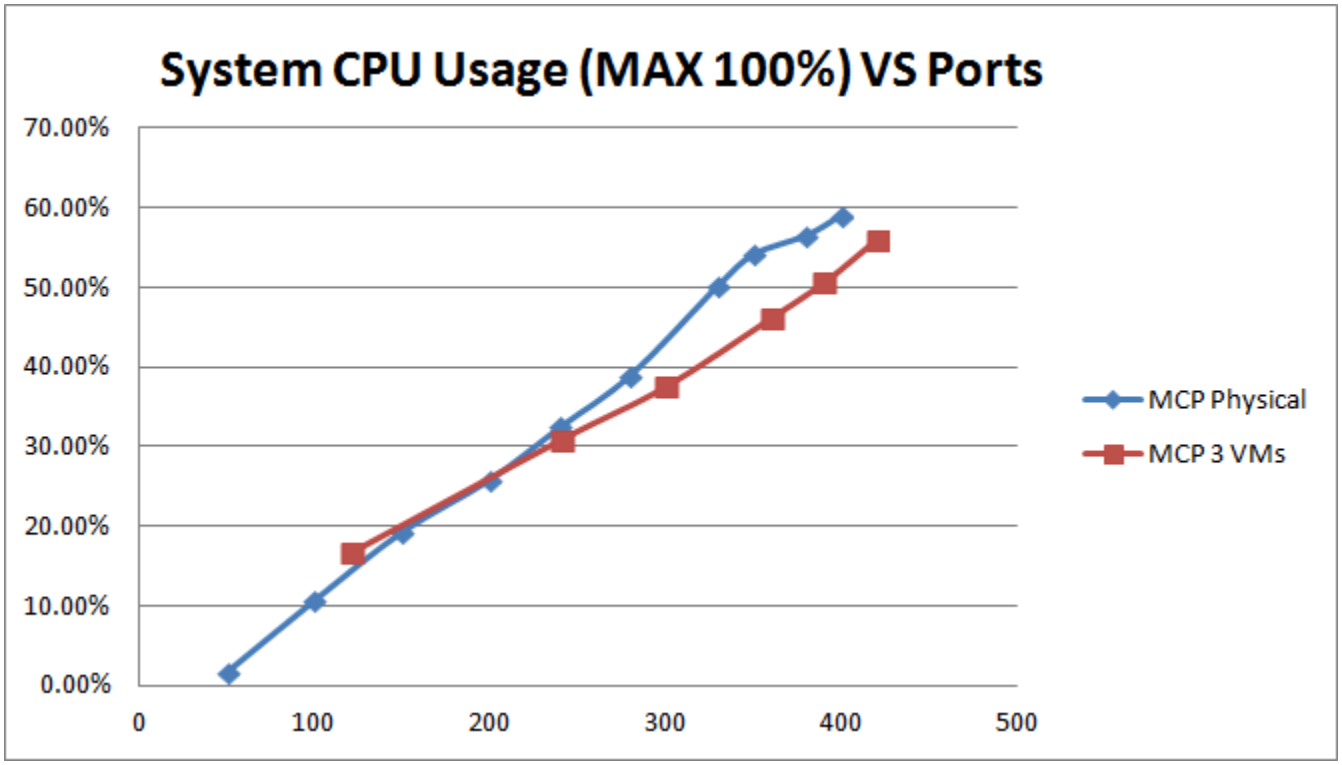

Figure 6: Comparison of System Usage between Physical Server and VM from Dual Hex Cores

The next two graphs show 95 percentile values of Max Jitter and Max Delta from sample RTP stream quality analysis:

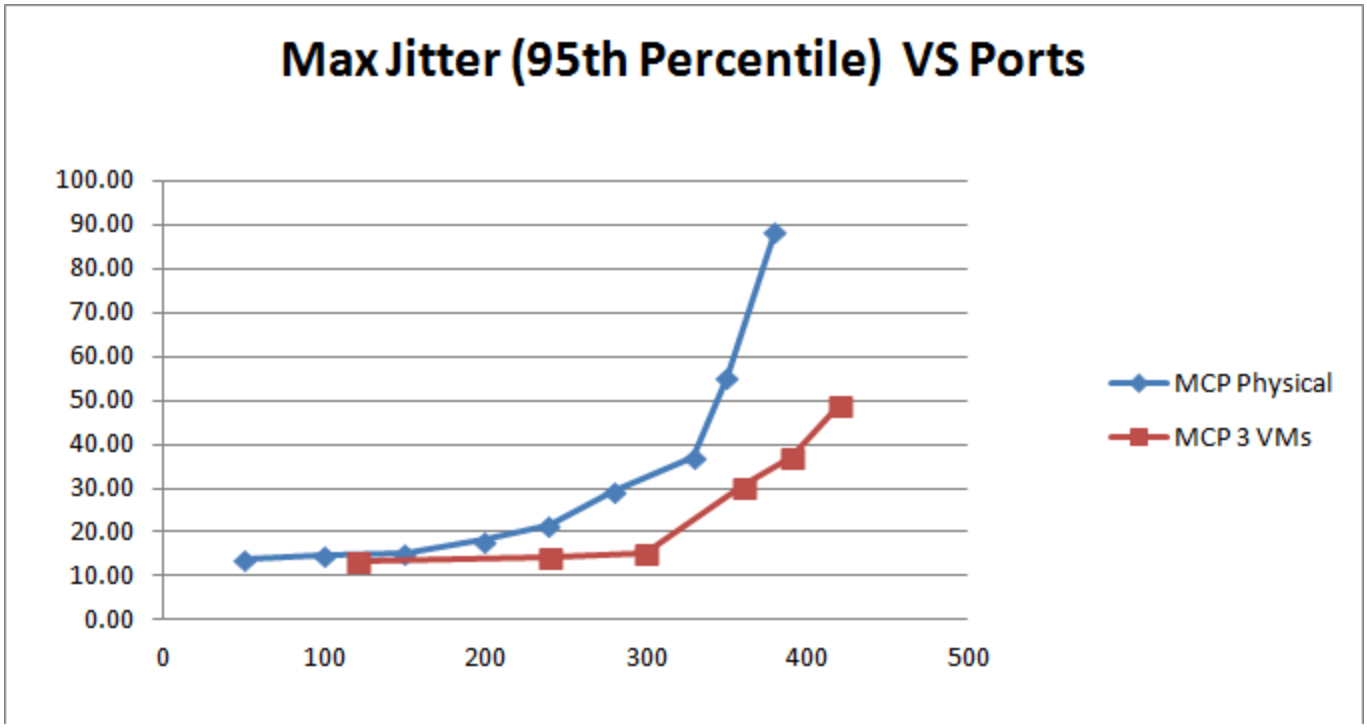

Figure 7: Comparison of Max Jitter between Physical Server and VM from Dual Hex Cores

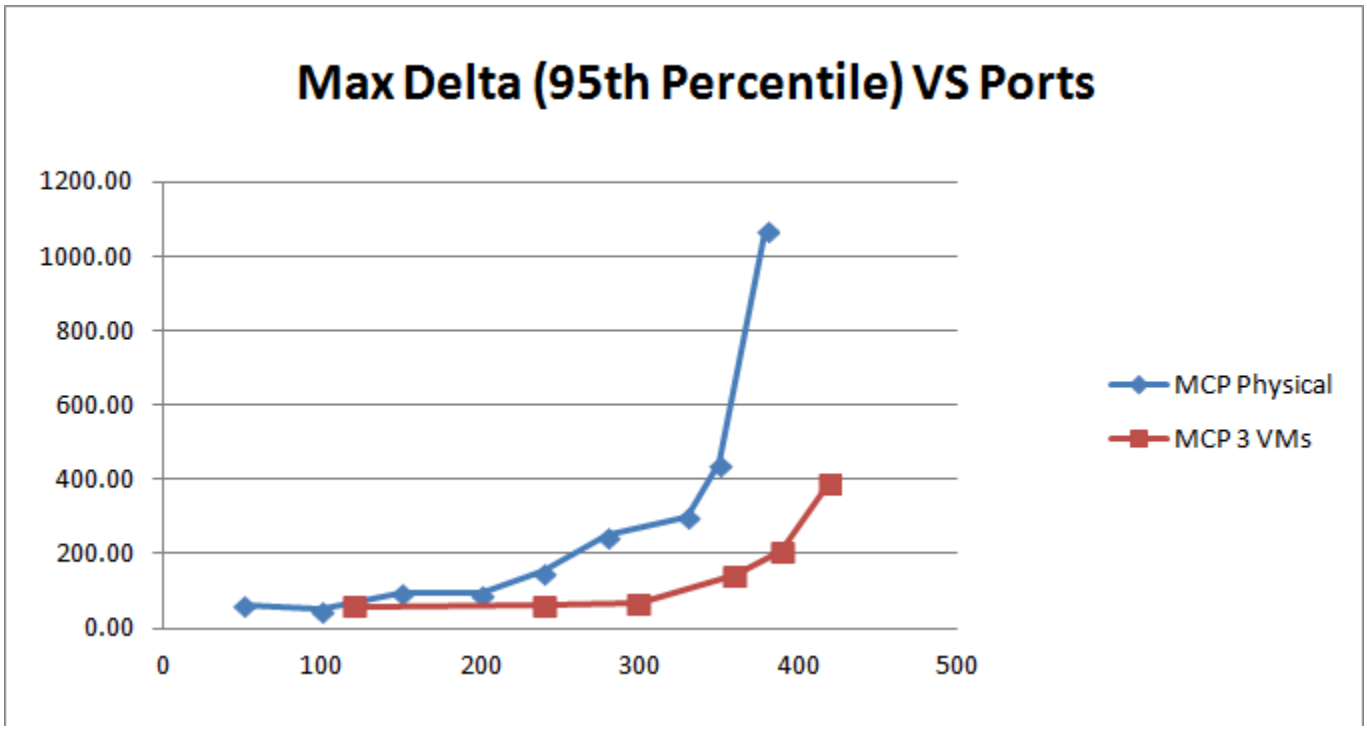

Figure 8: Comparison of Max Delta between Physical Server and VM from Dual Hex Cores

The two tables below show:

- Disk IOPS at system level on a physical server.
  and
- Disk IOPS at system level on a VM environment.

Table 3: Disk IOPS at system level from physical server of dual hex cores

Ports	Disk IOPS Physical Server		
Total	Reads	Writes	
50	9.069	0.000	9.07
100	18.587	0.000	18.59
150	28.598	0.001	28.60
200	37.460	0.001	37.46
240	41.290	0.003	41.29
280	49.031	0.020	49.01
330	53.373	0.001	53.37
350	53.150	0.001	53.15
380	61.456	0.001	61.46
400	64.123	0.001	64.12

Table 4: Disk IOPS of sum of all 3 VMs of dual hex cores

Ports	Overall Disk IOPS		
Total	Reads	Writes	
120	22.38	0.024	22.35
240	38.99	0.012	38.97
300	48.60	0.017	48.59
360	56.05	0.047	56.00
390	60.24	0.002	60.24
420	64.59	0.028	64.57

The graph below compares the above two tables above:

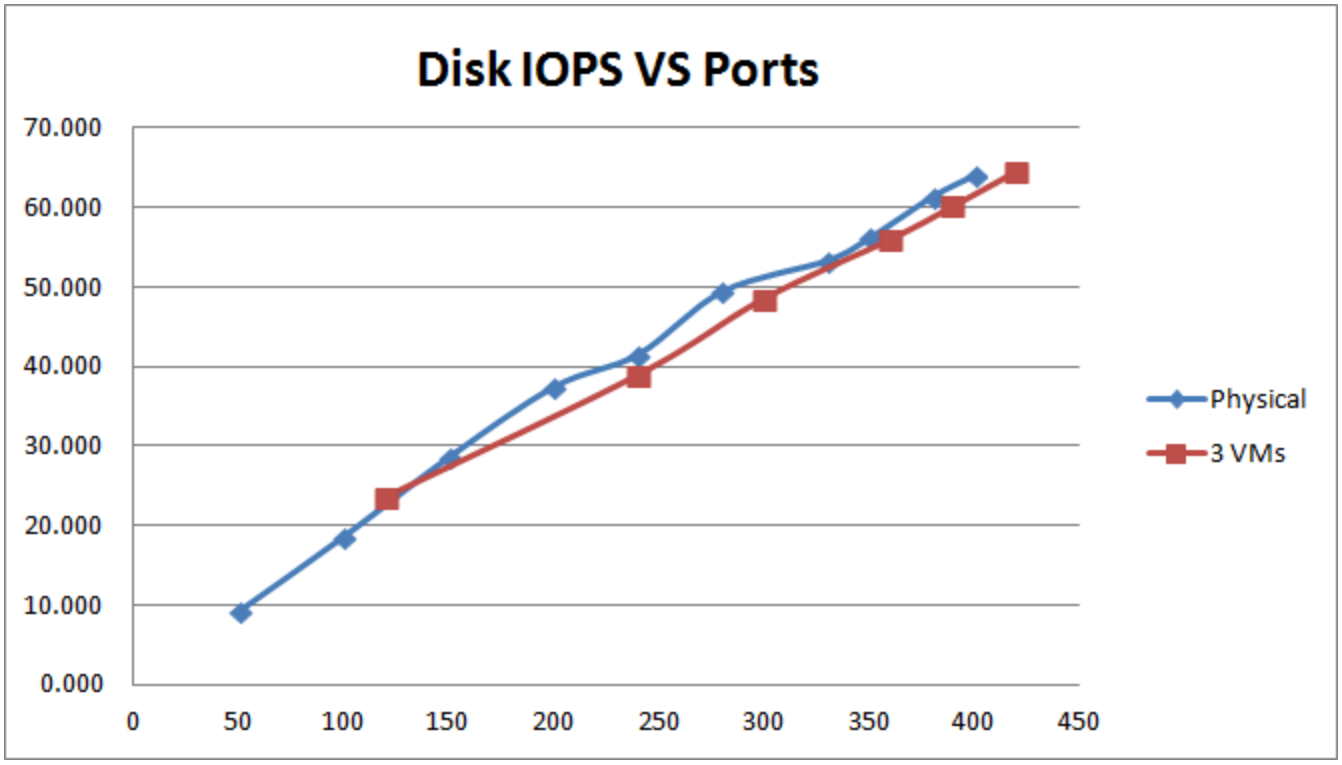

Figure 9: Comparison of System Disk IOPS Physical Server and VM from Dual Hex Cores

- Comparing the figure Comparison of System Disk IOPS Physical Server and VM from Single Hex Core and Comparison of System Disk IOPS Physical Server and VM from Dual Hex Cores: IOPS is linearly related to ports. No big differences exist between the physical server and the VM environment.
- SSD is used only in VM environments, as the cache folder of MCP recordings, while an SAS HDD drive is used to install the OS and MCP.