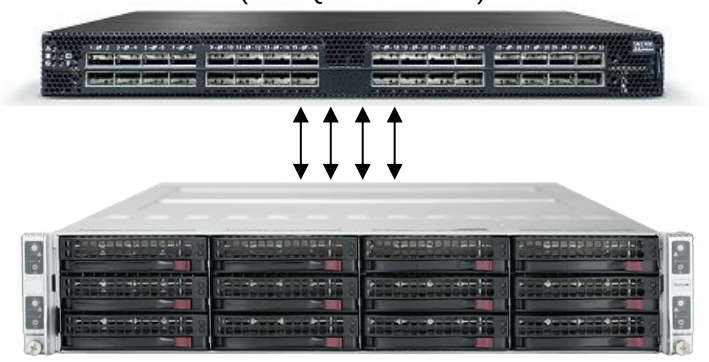
TTA	**Machbase 5.7.13**	TPCx-IoT 1.0.5 TPC Pricing 2.5.0 Report Date Apr. 14, 2020

Total System Cost	TPCx-IoT Performance Metric	Price/Performance
$429,659 USD	**2,480,917.60 IoTps**	**$0.18 USD/IoTps**

Servers	Operating System	Other Software	Availability Date
Supermicro A+ Server 2014TP-HTR	Red Hat Enterprise Linux Server Release 7.7	None	April 14, 2020

System Under Test Configuration Overview

Mellanox SN2700 100Gb Ethernet Switch
(32 x QSFP28 Ports)



1 x Supermicro A+ Server 2014TP-HTR
TwinPro™ with 4x H12SST-PS Nodes, each with:

1 x Master Node
- 1 x AMD EPYC 7702P 64-Core Processor
- 8 x 64GB (512GB) Memory
- 1 x 100GbE 2-Port Adaptor
- 1 x 25GbE 2-Port and 10GbE 2-Port Adaptor
- 1 x 960GB SATA SSD
- 1 x 1TB M.2 PCIe SSD

3 x Data Nodes
- 1 x AMD EPYC 7F72 24-Core Processor
- 8 x 32GB (256GB) Memory
- 1 x 100GbE 2-Port Adapter
- 1 x 25GbE 2-Port and 10GbE 2-Port Adaptor
- 1 x 960GB SATA SSD
- 4 x 3.84TB M.2 PCIe SSD

Total Servers:	1x Supermicro A+ Server 2014TP-HTR (TwinPro™ with 4x H12SST-PS Nodes)
Total Processors/Cores/Threads:	4/136/272

Server Configuration:	1x Master Node	3x Data Nodes
Processor	1x AMD EPYC 7702P (2.00GHz, 64-core, 256 MB L3)	1x AMD EPYC 7F72 (3.20GHz, 24-core, 192 MB L3)
Memory	512 GiB	256 GiB
Storage Device	1x 960GB SATA SSD 1x 1TB M.2 PCIe SSD Gen3	1x 960GB SATA SSD 4x 3.84TB M.2 PCIe SSD Gen3
Network Controller	1x Mellanox MCX516A-CCAT 100GbE 1x Supermicro AOC-MH25G-m2S2TM 10GbE and 25GbE	1x Mellanox MCX516A-CCAT 100GbE 1x Supermicro AOC-MH25G-m2S2TM 10GbE and 25GbE
Connectivity	Mellanox SN2700 100GbE Switch	
Total Rack Units:	(2x 2014TP-HTR) + (1x SN2700) = (2x1) + (1x1) = 3 RU	

Machbase 5.7.13

TPCx-IoT	1.0.5
TPC Pricing	2.5.0
Report Date	Apr. 14, 2020

Description	Part Number	Source	List Price (USD)	Qty	Extended Price (USD)	3 yr. Maint. Price (USD)
Server Hardware						
Supermicro A+ Server 2014TP-HTR	AS -2014TP-HTR	1	4,500.00	1	4,500.00	
AMD EPYC 7702P 64-Core Processor	PSE-ROM7702P-0047	1	4,229.00	1	4,229.00	
AMD EPYC 7F72 24-Core Processor	PSE-ROM7F72-0141	1	4,117.00	3	12,351.00	
SK hynix 64GB PC4-3200	MEM-DR464L-HL02-ER32	1	320.74	8	2,565.92	
SK hynix 32GB PC4-3200	MEM-DR432L-HL01-ER32	1	159.51	24	3,828.24	
Mellanox 100GbE Dual-Port NIC	AOC-MCX516A-CCAT	1	976.35	4	3,905.40	
2-port 25GbE SFP28 Mellanox CX-4 Lx EN and 2-port 10GbE RJ45 Intel X550	AOC-MH25G-m2S2TM	1	287.39	4	1,149.56	
1 TB NVMe SSD Toshiba KXG50ZNV1T02	HDS-TMN0-KXG50ZNV1T02	1	175.00	1	175.00	
3.84TB NVMe SSD Samsung PM983	HDS-SMN1-MZ1LB3T8HMLA07	1	677.35	12	8,128.20	
Samsung PM883 960GB SATA 6Gb/s V4 TLC 2.5" 7mm (1.3 DWPD)	HDS-S2T1-MZ7LH960HAJR05	1	169.63	4	678.52	
ASSEMBLY FEE	MC0037	1	250.00	1	250.00	
Maintenance - 7x24x4 Care Pack (3-yrs)	OS4HR3	1	3,500.00	1		3,500.00
				Sub-Total	41,760.84	3,500.00
Network						
Mellanox MSN2700-CS2F Spectrum 100GbE 1U Open Ethernet Switch	MSN2700-CS2F	2	33,003.00	1	33,003.00	
Mellanox SUP-SN2000-CL-S-3S-4H Technical Support and Warranty - Silver 3 Year with 4 Hours On-Site Support for SN2700 Cumulus Series Switch	SUP-SN2000-CL-S-3S-4H	2	3,345.00	1		3,345.00
Mellanox MCP1600-E002E30 Passive Copper Cable IB EDR up to 100Gb/s QSFP28 2m Black 30AWG	MCP1600-E002E30	2	145.00	4	580.00	
				Sub-Total	33,583.00	3,345.00
Software						
Red Hat Enterprise Linux Server7.7 with Premium Support 1 Year	RH00003	3	1,299.00	12		15,588.00
Machbase v5.7.13 Cluster Edition (includes 1y 7x24x4 Technical Support)	-	4	98,000.00	4	392,000.00	
Machbase v5.7.13 Cluster Edition 7x24x4 Technical Support	-	4	58,800.00	2		117,600.00
				Sub-Total	392,000.00	133,188.00
Infrastructure						
HP EliteDisplay E243 23.8-inch Monitor (w/ spares)	1FH47A8#ABA	5	179.00	3	537.00	
HP Slim USB Keyboard and Mouse (w/ spares)	T6T83UT#ABA	5	35.00	3	105.00	
				Sub-Total	642.00	-
Discounts*						
Machbase v5.7.13 Cluster Edition (includes 1y 7x24x4 Technical Support)					(137,200.00)	
Machbase v5.7.13 Cluster Edition 7x24x4 Technical Support						(41,160.00)
				Sub-Total	(137,200.00)	(41,160.00)
				Total	**$330,785.84 USD**	**$98,873.00 USD**

Price Source

1) Super Micro Computer Inc. 2) Mellanox Technologies, Ltd.
3) Red Hat Inc. 4) Machbase Inc. 5) Hewlett Packard Inc.

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*All discounts are based on US list prices and for similar quantities and configurations. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the configuration.

Three-Year Cost of Ownership:	**$429,659 USD**
IoTps:	**2,480,917.60**
USD/IoTps:	**$0.18 USD**

Prices used in TPC benchmarks must reflect the actual prices a customer would pay for purchase of the components in all regions specified in the result. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing conventions for the listed components. For complete details, see the pricing section of the TPC benchmark specification. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

	Machbase 5.7.13	TPCx-IoT	1.0.5
		TPC Pricing	2.5.0
		Report Date	Apr. 14, 2020

Numerical Quantities

Scale Factor	4500000000

Performance Run (Run2)

Warmup Run Start Time	2020-03-01 22:46:43.000
Warmup Run End Time	2020-03-01 23:17:05.000
Warmup Run Elapsed Time	1,821.296
Measured Run Start Time	2020-03-01 23:17:05.000
Measured Run End Time	2020-03-01 23:47:20.000
Measured Run Elapsed Time	1,813.845
Performance Metric (IoTps)	**2,480,917.60**

Repeatability Run (Run1)

Warmup Run Start Time	2020-03-01 21:43:09.000
Warmup Run End Time	2020-03-01 22:13:16.000
Warmup Run Elapsed Time	1,806.022
Measured Run Start Time	2020-03-01 22:13:16.000
Measured Run End Time	2020-03-01 22:43:29.000
Measured Run Elapsed Time	1,812.287
Performance Metric (IoTps)	2,483,050.42

	Machbase 5.7.13	TPCx-IoT	1.0.5
		TPC Pricing	2.5.0
		Report Date	Apr. 14, 2020

Performance Run Report (Run2)

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TPCx-IoT Performance Metric (IoTps) Report

Test Run2 details : Total Time For Warmup Run In Seconds = 1,821.296

Test Run2 details : Total Time In Seconds = 1,813.845

Total Number of Records = 4500000000

TPCx-IoT Performance Metric (IoTps): 2480917.6087

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Repeatability Run Report (Run1)

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TPCx-IoT Performance Metric (IoTps) Report

Test Run1 details : Total Time For Warmup Run In Seconds = 1,806.022

Test Run1 details : Total Time In Seconds = 1,812.287

Total Number of Records = 4500000000

TPCx-IoT Performance Metric (IoTps): 2483050.4219

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Summary details of the run reports are show above. For the complete run reports, see the Supporting Files Archive.

	Machbase 5.7.13	TPCx-IoT	1.0.5
		TPC Pricing	2.5.0
		Report Date	Apr. 14, 2020

Revision History

Date	Edition	Description
April 14, 2020	First	Initial Publication