TPC Express Benchmark™ IoT
Full Disclosure Report

Machbase 7.0.6
running on

Dell PowerEdge R7615
(with 5x Dell PowerEdge R7615 Nodes)

with

Red Hat Enterprise Linux Server Release 8.6

TPCx-IoT Version 2.1.0
Report Edition First
Report Submitted Nov 13, 2022
First Edition – November 2022

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Abstract

TTA conducted the TPC Express Benchmark™ IoT (TPCx-IoT) on the PowerEdge R7615 with 5x PowerEdge R7615 Nodes. The software used included Machbase 7.0.6. This report provides full disclosure of the methodology and results. All testing was conducted in conformance with the requirements of the TPCx-IoT Standard Specification, Revision 2.1.0.

The benchmark results are summarized below.

### Configuration Summary

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>Cluster Nodes</th>
<th>Storage Software</th>
<th>Operating System</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTA Dell</td>
<td>Dell PowerEdge R7615</td>
<td>Machbase 7.0.6</td>
<td>Red Hat Enterprise Linux Release 8.6</td>
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### TPC Express Benchmark™ IoT Metrics

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<th>Total System Cost (USD)</th>
<th>IoTps</th>
<th>USD/kIoTps</th>
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<td>5,739,514.34</td>
<td>$86.42</td>
<td>Feb 28, 2023</td>
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</table>

### Executive Summary

The [Executive Summary](#) follows on the next several pages.
**EXECUTIVE SUMMARY**

**Machbase 7.0.6**

**Total System Cost** | **TPCx-IoT Performance Metric** | **Price/Performance**
---|---|---
$496,021.74 USD | 5,739,514.34 IoTps | $86.42 USD/kIoTps

<table>
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<th>Servers</th>
<th>Operating System</th>
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<td>Red Hat Enterprise Linux Server Release 8.6</td>
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<td>Feb 28, 2023</td>
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</table>

**System Under Test Configuration Overview**

![System Diagram](image)

**Total Servers:** 5x Dell PowerEdge R7615  
**Total Processors/Cores/Threads:** 5/224/448

**Server Configuration:**

- **Processor:**
  - Master Node: 2x AMD EPYC 9554 (2.7GHz, 64-core, 256 MB L3)
  - 12x 64GB (768GB) Memory
  - 1x 100GbE 2-Port Adapter
  - 1x 600GB SAS HDD

- **Memory:**
  - 2x 768 GB
  - 1x 600GB SAS U.2 HDD
  - 1x 960GB SAS U.2 SSD

- **Storage Device:**
  - 2x Mellanox MT28800 Family 100GbE
  - 2x Broadcom BCM5720 Dual-Port 1GbE

- **Network Controller:**
  - NVIDIA MSN2700 100GbE Ethernet Switch

- **Connectivity:**
  - (5x PowerEdge R7615) + (1x MSN2700) = (5x2) + (1x1) = 11 RU

- **Data Nodes:**
  - 3x AMD EPYC 9374F (3.3GHz, 32-core, 256 MB L3)
  - 3x 384 GB
  - 6x 240GB NVMe M.2 SSD
  - 24x 3.84TB NVMe U.2 SSD
  - 3x Mellanox MT28800 Family 100GbE
  - 3x Broadcom BCM5720 Dual-Port 1GbE

**Report Date**

TPCx-IoT 2.1.0  
TTA, Dell  
Machbase 7.0.6  
Nov 13, 2022
## EXECUTIVE SUMMARY

### Machbase 7.0.6

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<td>- Dell 24 Monitor</td>
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EXECUTIVE SUMMARY

NVMe Backplane 379-BDSX 1 0.00 3
Trusted Platform Module 2.0 V3 461-AAIM 1 0.00 3
CS-3 16x U.2 G4 RAID Low Z (Two PERCs) 321-BIFN 1 0.00 3
AMO EPIC 9374F 3.85GHz, 32C/64T, 256M Cache [320W] DDR5-4800 338-CGXD 1 0.00 3
Standard Heatsink 412-AASE 1 0.00 3
Performance Optimized 370-AAIP 1 0.00 3
480D1T/s RDIMMs 370-AHCL 1 0.00 3
32GB RDIMM, 4800MT/s Dual Rank 370-AGZR 1 0.00 36
Unconfigured RAID 780-BCDS 1 0.00 3
BOSS-S2 controller card + with 2 M.2 403-BCMVG 1 0.00 3
240GB (RAID 1) PERC H730P Front 405-AAZE 1 0.00 24
3.84TB Data Center NVMe Read intensive 400-BMTN 1 0.00 3
AG Drive U2 Gen4 with Carrier Performance BIOS Settings 384-BBBL 1 0.00 3
High Performance Fan 750-AAWT 1 0.00 3
Dual, Hot-Plug, Power Supply Redundant [1+1], 1400W, Mixed Mode 450-APJG 1 0.00 6
Jumper Cord - C13/C14, 4M, 250V, 12A (North America, Guam, North Marianas, Philippines, Samoa) 492-BBDG 1 0.00 3
Riser Config 2, 2 x 16 FH + 2 x 16 LP PCIe slot 330-BBNL 1 0.00 3
Broadcom 5720 Dual Port 1GBe Optional LOM 540-BDKD 1 0.00 3
 Mellanox ConnectX-5 EX Dual Port 3 40/100GBase QSFP28 Adapter, PCIe Full Height 540-BCIU 1 0.00 3
PowerEdge R7615 Motherboard 329-BHOH 1 0.00 3
iDRAC9, Enterprise 15G 385-BBOZ 1 0.00 3
PowerEdge 2U Standard Bezel 350-BBWP 1 0.00 3
No Quick Sync 350-BKU 1 0.00 3
iDRAC Legacy Password 379-BCSG 1 0.00 3
iDRAC Group Manager, Enabled 379-BCCV 1 0.00 3
Red Hat Enterprise Linux 8.6 (Ootpa), kernel 4.18.0-372.9.1.el8.x86_64 605-BBFL 1 0.00 3
No Media Required 605-BBFR 1 0.00 3
Ready Rails Sliding Rails 770-BBBQ 1 0.00 3
No Internal Optical Drive 429-AAIQ 1 0.00 3
No Systems Documentation, NoOpenManage DVD Kit 631-AACK 1 0.00 3
PowerEdge R7615 Shipping 340-CMZG 1 0.00 3
PowerEdge R7615 Ship Material 340-CODN 1 0.00 3
PowerEdge R7615 No CE or CCC Marking 343-BBPP 1 0.00 3
US Order 332-1286 1 0.00 3
Dell Hardware Limited Warranty Plus On-Site Service 827-1402 1 200.00 3 600.00
ProSupport Mission Critical: 7x24 HW / SW Technical Support and Assistance 3 Years 827-1344 1 1,383.00 3 4,149.00
ProSupport Mission Critical: 4-Hour 7x24 On-Site Service with Emergency Dispatch 3 Years 827-1352 1 717.00 3 2,151.00
On-Site Installation Declined 900-9997 1 0.00 3
Dell 24 Monitor 210-AIWG 1 169.99 1 169.99
600GB Hard Drive SAS ISE 12Gbps 10K 400-BIFV 1 587.62 1 587.62
512 2.5in Hot-Plug 400-AQXU 1 2,468.62 1 2,468.62
960GB SSD SAS ISE Read Intensive 12Gbps 512 2.5in Hot-plug AG Drive, 1 DWPD, APIS647 - APC Basic Rack FDU - OU - 120V NEMA 5-15 Input / 14 x NEMA 5-15 Output A7541364 1 263.00 1 263.00
Sub-Total 404,038.22 11,500.00

Network Hardware
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TPCx-IoT 2.1.0 TTA, Dell Full Disclosure Report Machbase 7.0.6 Report Date Nov 13, 2022
## EXECUTIVE SUMMARY

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<th>Description</th>
<th>Model</th>
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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.

**Price Source**
1) Dell Inc. 2) NVIDIA Inc. 3) Machbase Inc. 4) Hewlett Packard Inc.

**Audited by Pre-Publication Board**

*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 7.0.6

### Numerical Quantities

| Scale Factor | 13,000,000,000 |

### Performance Run (Run1)

| Warmup Run Start Time | 2022-11-13 17:10:23.000 |
| Warmup Run End Time | 2022-11-13 17:44:32.000 |
| Warmup Run Elapsed Time | 2,049.000 |

| Measured Run Start Time | 2022-11-13 17:44:33.000 |
| Measured Run End Time | 2022-11-13 18:22:06.000 |
| Measured Run Elapsed Time | 2,253.000 |

| Performance Metric (IoTps) | 5,770,084.33 |

### Repeatability Run (Run2)

| Warmup Run Start Time | 2022-11-13 18:23:14.000 |
| Warmup Run End Time | 2022-11-13 18:58:07.000 |
| Warmup Run Elapsed Time | 2,093.000 |

| Measured Run Start Time | 2022-11-13 18:58:08.000 |
| Measured Run End Time | 2022-11-13 19:35:53.000 |
| Measured Run Elapsed Time | 2,265.000 |

| Performance Metric (IoTps) | 5,739,514.34 |
Performance Run Report (Run1)

TPCx-IoT Performance Metric (IoTps) Report
Test Run2 details : Total Time For Warmup Run In Seconds = 2,049.000
Test Run2 details : Total Time In Seconds = 2,253.000
Total Number of Records = 13,000,000,000

TPCx-IoT Performance Metric (IoTps): 5,770,084.33

Repeatability Run Report (Run2)

TPCx-IoT Performance Metric (IoTps) Report
Test Run1 details : Total Time For Warmup Run In Seconds = 2,093.000
Test Run1 details : Total Time In Seconds = 2,265.000
Total Number of Records = 13,000,000,000

TPCx-IoT Performance Metric (IoTps): 5,739,514.34

Summary details of the run reports are show above. For the complete run reports, see the Supporting Files Archive.
## Machbase 7.0.6

### Revision History

<table>
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<th>Date</th>
<th>Edition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 13, 2022</td>
<td>First</td>
<td>Initial Publication</td>
</tr>
</tbody>
</table>
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Clause 0  Preamble

0.1  TPC Express Benchmark™ IoT Overview

TPC Express Benchmark™ IoT (TPCx-IoT) was developed to provide an objective measure of hardware, operating system and commercial NoSQL database software distributions, and to provide the industry with verifiable performance, price-performance and availability metrics. The benchmark models a continuous system availability of 24 hours a day, 7 days a week.

Even though the modeled application is simple, the results are highly relevant to hardware and software dealing with IoT gateway systems in general. TPCx-IoT stresses both hardware and software including database APIs and network connections to the database. This workload can be used to assess a broad range of NoSQL databases. TPCx-IoT can be used to assess a range of NoSQL implementations in a technically rigorous and directly comparable and vendor-neutral manner. The metric effectively represents the total number of records that can be inserted into a NoSQL database per second while running queries against the database.

The TPCx-IoT kit is available from the TPC (See www.tpc.org/tpcx-iot for more information). Users must sign up and agree to the TPCx-IoT User Licensing Agreement (ULA) to download the kit. Redistribution of the kit is prohibited. All related work (such as collaterals, papers, derivatives) must acknowledge the TPC and include TPCx-IoT copyright. The TPCx-IoT Kit includes: the TPCx-IoT Specification document, the TPCx-IoT Users Guide document, shell scripts to set up the benchmark environment and Java code to execute the benchmark load.

The purpose of TPC benchmarks is to provide relevant, objective performance data to industry users. To achieve that purpose, TPC benchmark specifications require that benchmark tests be implemented with systems, products, technologies and pricing that:

- Are generally available to users;
- Are relevant to the market segment that the individual TPC benchmark models or represents (e.g., TPCx- IoT models and represents a NoSQL database mimicking an IoT gateway system)
- Would plausibly be implemented by a significant number of users in the market segment the benchmark models or represents.

The use of new systems, products, technologies (hardware or software) and pricing is encouraged so long as they meet the requirements above. Specifically prohibited are benchmark systems, products, technologies or pricing (hereafter referred to as "implementations") whose primary purpose is performance optimization of TPC benchmark results without any corresponding applicability to real-world applications and environments. In other words, all "benchmark special" implementations that improve benchmark results but not real-world performance or pricing, are prohibited.

The rules for pricing are included in the TPC Pricing Specification. Further information is available at www.tpc.org.
Clause 1 General Items

1.1 Test Sponsor
A statement identifying the benchmark sponsor(s) and other participating companies must be provided.

This benchmark was sponsored by Telecommunications Technology Association and Dell Inc..

1.2 Parameter Settings
Settings must be provided for all customer-tunable parameters and options which have been changed from the defaults found in actual products, including by not limited to:

- Configuration parameters and options for server, storage, network and other hardware component incorporated into the pricing structure;
- Configuration parameters and options for operating system and file system component incorporated into the pricing structure;
- Configuration parameters and options for any other software component incorporated into the pricing structure;
- Compiler optimization options.

Comment 1: In the event that some parameters and options are set multiple times, it must be easily discernible by an interested reader when the parameter or option was modified and what new value it received each time.

Comment 2: This requirement can be satisfied by providing a full list of all parameters and options, as long as all those that have been modified from their default values have been clearly identified and these parameters and options are only set once.

The Supporting Files Archive contains the parameters and options used to configure the components involved in this benchmark.

1.3 Configuration Diagrams
Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences.

This includes, but is not limited to:

- Total number of nodes used
- Total number and type of processors used/total number of cores used/total number of threads used (including sizes of L2 and L3 caches)
- Size of allocated memory, and any specific mapping/partitioning of memory unique to the test
- Number and type of disk units (and controllers, if applicable)
- Number of channels or bus connections to disk units, including their protocol type
- Number of LAN (for example, Ethernet) connections and speed for switches and other hardware components physically used in the test or are incorporated into the pricing structure
- Type and the run-time execution location of software components
1.3.1 Measured Configuration

Figure 1-1 shows the measured configuration.

The measured configuration consisted of:

- **Total Nodes**: 5
- **Total Processors/Cores/Threads**: 5/224/449
- **Total Memory**: 2,688GB
- **Total Number of Storage Devices**: 32
- **Total Storage Capacity**: 92.93TB

**Connectivity**: NVIDIA MSN2700 100GbE Switch

**Servers**
- **Processor Model**: 2x AMD EPYC 9554 (2.7GHz, 64-core, 256MB L3)
- **Memory**: 2x 768GB
- **Storage Devices**: 1x 600GB SAS U.2 HDD, 1x 960GB SAS U.2 SSD
- **Network Controller**: 2x Mellanox MT28800 Family 100GbE, 2x Broadcom BCM5720 Dual-Port 1GbE

**Processors/Cores/Threads**
- **Processor Model**: 3x AMD EPYC 9374F (3.3GHz, 32-core, 256MB L3)
- **Memory**: 3x 384GB
- **Storage Devices**: 6x 240GB NVMe M.2 SSD, 24x 3.84TB NVMe U.2 SSD
- **Network Controller**: 3x Mellanox MT28800 Family 100GbE, 3x Broadcom BCM5720 Dual-Port 1GbE

The distribution of software components over server nodes is detailed in section 1.5.
1.3.2 Priced Configuration
There are no differences between the priced configuration and the measured configuration.

1.4 Dataset Distribution
*The distribution of dataset across all media must be explicitly described.*

Table 1-1 describes the distribution of the dataset across all storage media in the system.

<table>
<thead>
<tr>
<th>Server</th>
<th>Storage</th>
<th>Disk Drive</th>
<th>Description of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>U.2 PCIe Gen3</td>
<td>1 x 600GB SAS HDD</td>
<td>Machbase Broker, Operating System, Root, Swap, coordinator</td>
</tr>
<tr>
<td></td>
<td>U.2 PCIe Gen3</td>
<td>1 x 960GB SAS SSD</td>
<td></td>
</tr>
<tr>
<td>3-5</td>
<td>M.2 PCIe Gen4</td>
<td>3 x 240GB NVMe SSD</td>
<td>Operating System, Root, Swap</td>
</tr>
<tr>
<td></td>
<td>U.2 PCIe Gen4</td>
<td>8 x 3.84TB NVMe SSD</td>
<td>Machbase Data,</td>
</tr>
</tbody>
</table>

*Table 1-1 Dataset Distribution Across Storage Media*

1.5 Software Component Distribution
*The distribution of various software components across the system must be explicitly described.*

Table describes the distribution of the software components across the system.

<table>
<thead>
<tr>
<th>Server</th>
<th>Broker</th>
<th>Coordinator</th>
<th>Warehouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

*Table 1-2 Software Component Distribution Across Nodes*

The storage system software used was Machbase 7.0.6.
Clause 2 Workload Related Items

2.1 Hardware and Software Tunable Parameters

*Script or text used to set all hardware and software tunable parameters must be reported.*

The Supporting Files Archive contains all configuration scripts.

2.2 Run Report

*The run report generated by the TPCx-IoT Kit for Performance Run and Repeatability Run must be reported.*

The Supporting Files Archive contains the full run report. The following excerpts from the run report summarize the Performance Run and the Repeatability Run.

---

**Run Report for Run 1 (Repeatability Run)**

<table>
<thead>
<tr>
<th>TPCx-IoT Performance Metric (IoTps) Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Run 1 details: Total Time For Warmup Run In Seconds = 2,049.000</td>
</tr>
<tr>
<td>Test Run 1 details: Total Time In Seconds = 2,253.000</td>
</tr>
<tr>
<td>Total Number of Records = 13,000,000,000</td>
</tr>
</tbody>
</table>

TPCx-IoT Performance Metric (IoTps): 5,770,084.33

---

**Run Report for Run 2 (Performance Run)**

<table>
<thead>
<tr>
<th>TPCx-IoT Performance Metric (IoTps) Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Run 2 details: Total Time For Warmup Run In Seconds = 2,093.000</td>
</tr>
<tr>
<td>Test Run 2 details: Total Time In Seconds = 2,265.000</td>
</tr>
<tr>
<td>Total Number of Records = 13,000,000,000</td>
</tr>
</tbody>
</table>

TPCx-IoT Performance Metric (IoTps): 5,739,514.34

---
2.3 Benchmark Kit Identification
The version of the TPCx-IoT kit and checksums for key files are listed below.

<table>
<thead>
<tr>
<th>File</th>
<th>MD5</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPC-IoT-master.sh</td>
<td>cc24620cfdee08290d771c5471a8d1ee</td>
</tr>
<tr>
<td>tpxc-iot/machbase-binding/lib/core-0.13.0-SNAPSHOT.jar</td>
<td>7566fae175b35cd2e396814ecba3da39</td>
</tr>
<tr>
<td>IoT_cluster_validate_suite.sh</td>
<td>b2342754095f973ce27f43c28d3ca0ae</td>
</tr>
</tbody>
</table>

The md5sum in our publication is different from that of the official KIT, because we used a pre-published compile of the KIT, which was also used for testing the KIT as part of the release procedure.

2.4 Benchmark Kit Changes
No modifications were made to TPC-provided kit.
Clause 3  Scale Factor and Metrics

3.1  Scale Factor, Performance, Price-Performance

The metrics for Run 1 and Run 2 are summarized below.

<table>
<thead>
<tr>
<th></th>
<th>Run 1</th>
<th>Run 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale Factor</td>
<td>13,000,000,000</td>
<td>13,000,000,000</td>
</tr>
<tr>
<td>Measured Run Time (seconds)</td>
<td>2,253.000</td>
<td>2,265.000</td>
</tr>
<tr>
<td>IoTps</td>
<td>5,770,084.33</td>
<td>5,739,514.34</td>
</tr>
</tbody>
</table>

Run2 Price-Performance: 86.42 $/kIoTps
Third-Party Price Quotes
NVIDIA Inc

Date: 11/8/2022
Quote #: Q-665140
Opportunity #: O-313351
Expiration Date: 2/6/2023

Advanced Micro Devices (AMD)

Pricing Request Type

NPN Solution Provider
Direct

End Customer
Advanced Micro Devices (AMD)
United States

NVIDIA Salesperson
Martin McNamey
mcnamey@nvidia.com

<table>
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<tr>
<th>Qty</th>
<th>Part Number</th>
<th>Reference Part Number</th>
<th>Description</th>
<th>Term (Year)</th>
<th>Unit Price</th>
<th>Discount (%)</th>
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<th>Total</th>
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<td>$16,661.00</td>
<td>0.00</td>
<td>$16,661.00</td>
<td>$16,661.00</td>
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<td>P2CM036</td>
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<td>3</td>
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<td>0.00</td>
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</table>

Net Total $20,327.00

NOTES

- All pricing is in USD and subject to change. Pricing does not include currency conversion fees, taxes or VAT, and other considerations that may affect the final price that you pay.
- Purchase Order Receipt Date and Customer Request Date (CRD) must be earlier than Quote expiration date.
- Distributor Purchase Order to NVIDIA:
  - Quote number listed in this document must be included and can only be used for one unique order and may not be used in any other orders.
  - All products, quantities, pricing, reseller and end customer information must align with those on the referenced, valid quote.
  - Reseller, Reseller Contact, End Customer Information
  - Must include full company name with no acronyms or abbreviations, address, first and last name of the product end customer contact, and a valid email address with a domain that matches the company name.
- Please reference your NVIDIA Price List for all ordering rules.
- This document serves as a pricing information to the Distributor.
- This quotation is subject to the terms and conditions specified in the applicable signed agreement between NVIDIA and Partner. In the absence of such signed agreement, NVIDIA’s Standard Terms & Conditions will apply.
- Accordingly, the products are offered under the applicable terms and conditions, and this quotation is expressly conditional on acceptance of such terms and conditions. No additional or conflicting terms and conditions will apply without NVIDIA’s prior, express written consent, and any such additional or conflicting terms and conditions on partner’s purchase order, acknowledgement or other business form are hereby rejected by NVIDIA.

2888 San Tomas Expressway | Santa Clara, CA 95051 | T 408.486.2000 | F 408.486.2200 | www.nvidia.com

TPCx-IoT 2.1.0
Full Disclosure Report

TTA, Dell
Machbase 7.0.6
Report Date
Nov 13, 2022
<table>
<thead>
<tr>
<th>Product Description</th>
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<tr>
<td>NVIDIA MCP1600-C002E30N DAC Cable</td>
<td>$229.99</td>
</tr>
<tr>
<td>Ethernet 100GbE QSFP28 2m</td>
<td></td>
</tr>
<tr>
<td>Technology: Ethernet</td>
<td></td>
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<tr>
<td>Max Speed: 100GbE</td>
<td></td>
</tr>
<tr>
<td>Connector Type: QSFP28</td>
<td></td>
</tr>
<tr>
<td>Length: 2.0m</td>
<td></td>
</tr>
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</table>

TPCx-IoT 2.1.0
Full Disclosure Report

TTA, Dell
Machbase 7.0.6

Report Date
Nov 13, 2022
### Quotation

**Doc. No.:** MACH-SALES-20210222-05  
**Date:** 2022-11-09  
**To:** TTA  
**CC:** Mr. Seo Byong Joon  
**Charge:** Grey Shim  
(+82-10-9910-8086)

#### Business License
- **Company:** Machbase Inc.  
- **CEO:** Andrew Kim

#### Details
- **Address:** 10, Teheran-ro 20-gil, Gangnam-gu, Seoul, Korea

#### Telephone
- **Tel.** T: 02-2109-5607  
- **F:** 02-2038-4607

### Quote

<table>
<thead>
<tr>
<th>No.</th>
<th>Content</th>
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<th>Proposed Price (USD/Set)</th>
<th>Quantity (1Set=SNode)</th>
<th>Supply Price (USD)</th>
<th>Tax. Incl. (USD)</th>
</tr>
</thead>
</table>
| 1   | Machbase Cluster Edition V7.0.6  
Machbase Run-Time License  
Machbase Time Series DBMS  
Machbase Client Developmet Kit  
Machbase Coordinator  
Machbase Broker  
Machbase Warehouse  
Machbase Web Admin  
Machbase Tag Analyzer | 170,000 | 147,000 | 1 | 147,000 | 161,700 |
| 2   | Maintenance  
Support & On-site Guide  
Fault Handling  
API Connection  
Guide for Server & Node Configuration | 147,000 | 15% | 2.00 | 44,100 | 48,510 |

#### Total
- **Ref. Price (USD):** 191,100  
- **Supply Price (USD):** 210,210

**< REMARK >**
- Here is a quote for applying a Machbase time series database for TTA.
- Quotation: Machbase Cluster Edition Run-Time License 5 nodes (1Set) and 3 years Maintenance (1 Year for free)
- Maintenance: Free maintenance for one year after the contract, 15% of maintenance rate applied afterwards.
- Payment terms: Cash payment terms. (Within 30 days of issue of tax invoice)
- Server installation condition: It is recommended to separate DB server and Storage server.
- Installation: Cluster Edition - 7 Days, DB Table Guide is separately guided with DB Professional Service.
- Quotation validity period: 120 days from the date of quotation

---

**TPCx-IoT 2.1.0**  
**Full Disclosure Report**  
**Machbase Inc.**

**TTA, Dell**  
**Machbase 7.0.6**  
**Report Date**  
**Nov 13, 2022**
Hewlett Packard Inc.

HP Pavilion Keyboard and Mouse 200

- Simple shortcuts for better work
- Type in total comfort
- Compact, clean design

Can't find what you are looking for? See similar products

$21.99

Add to cart

IN STOCK. Ships in 1 business day

11/23/22 10:54 AM
## Supporting File Index

<table>
<thead>
<tr>
<th>Clause</th>
<th>Description</th>
<th>Archive Pathname</th>
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</thead>
<tbody>
<tr>
<td>Clause 1</td>
<td>Parameters and options used to configure and tune the SUT</td>
<td>/Clause1</td>
</tr>
<tr>
<td>Clause 2</td>
<td>Configuration scripts and Run Report</td>
<td>/Clause2</td>
</tr>
<tr>
<td>Clause 3</td>
<td>System configuration details</td>
<td>/Clause3</td>
</tr>
</tbody>
</table>