Telecommunications Technology Association

TPC Express Benchmark™ IoT Full Disclosure Report

Machbase 5.7.3

running on

KTNF KR580S1 Servers

with

CentOS Linux 7.6.1810

TPCx-IoT Version	1.0.4
Report Edition	First
Report Submitted	November 11, 2019

First Edition - November 2019

Telecommunications Technology Association (TTA)*, the Sponsor of this benchmark test, believes that the information in this document is accurate as of the publication date. The information in this document is subject to change without notice. The Sponsor assumes no responsibility for any errors that may appear in this document.*

The pricing information in this document is believed to accurately reflect the current prices as of the publication date. However, the Sponsor provides no warranty of the pricing information in this document.

Benchmark results are highly dependent upon workload, specific application requirements, and system design and implementation. Relative system performance will vary because of these and other factors. Therefore, the TPC Express Benchmark™ V should not be used as a substitute for a specific customer application benchmark when critical capacity planning and/or product evaluation decisions are contemplated.

All performance data contained in this report was obtained in a rigorously controlled environment. Results obtained in other operating environments may vary significantly. No warranty of system performance or price/performance is expressed or implied in this report.

TTA and the TTA Logo are trademarks of Telecommunications Technology Association and/or its affiliates in the U.S. and other countries. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between TTA and any other company

TPC Express Benchmark™ IoT, TPCx-IoT, and IoTps, are registered certification marks of the Transaction Processing Performance Council.

The TTA products, services or features identified in this document may not yet be available or may not be available in all areas and may be subject to change without notice. Consult your local TTA business contact for information on the products or services available in your area. You can find additional information via TTA's web site at https://www.tta.or.kr/. Actual performance and environmental costs of TTA products will vary depending on individual customer configurations and conditions.

Copyright© 2019 Telecommunications Technology Association

All rights reserved. Permission is hereby granted to reproduce this document in whole or in part provided the copyright notice printed above is set forth in full text or on the title page of each item reproduced

Abstract

TTA conducted the TPC Express Benchmark™ IoT (TPCx-IoT) on the KTNF KR580S1. The software used included Machbase 5.7.3. 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 1.0.4.

The benchmark results are summarized below.

Configuration Summary

Sponsor	Cluster Nodes	Storage Software	Operating System
TTA	1x KR580S1 (Master) 2x KR580S1 (Data)	Machbase 5.7.3	CentOS Linux 7.6.1810

TPC Express Benchmark™ IoT Metrics

Total System Cost (USD)	IoTps	USD/IoTps	Availability Date
$344,548	1,043,276.60	$0.34	Currently Available

Executive Summary

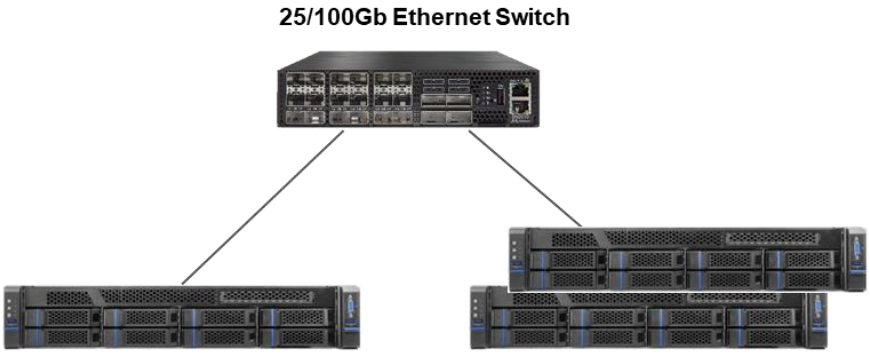
The Executive Summary follows on the next several pages.

TTA	**Machbase 5.7.3**	TPCx-IoT 1.0.4 TPC Pricing 2.4.0 Report Date Nov. 11, 2019

Total System Cost	TPCx-IoT Performance Metric	Price/Performance
$344,548 USD	**1,043,276.60 IoTps**	**$0.34 USD/IoTps**

Servers	Operating System	Other Software	Availability Date
KTNF KR580S1	CentOS Linux 7.6.1810	None	Currently Available

System Under Test Configuration Overview



Master Node

1 x KTNF KR580S1
- 2 x Intel Xeon Gold 6140 2.30GHz
- 12 x 64GB (768GB) Memory
- 2 x 600GB SAS HDD
- 1 x 25Gb 2-Port Ethernet Adaptor

Data Node

2 x KTNF KR580S1
- 2 x Intel Xeon Gold 6140 2.30GHz
- 4 x 64GB (256GB) Memory
- 2 x 600GB SAS HDD
- 2 x 1.6TB NVMe SSD
- 1 x 25Gb 2-Port Ethernet Adaptor

Total Servers:	3x KR580S1	
Total Processors/Cores/Threads:	6/108/216	
Server Configuration: Processor Memory Storage Controller Storage Device Network Controller	1x KR580S1 (Master): 2x Intel® Xeon® Gold 6140 (2.30GHz, 18-core, 24.75 MB L3) 768 GiB Broadcom MEGARAID SAS 9361-8i 2x 600 GB 10.5K RPM SAS HDD Mellanox MCX4121A-ACAT 25G	2x KR580S1 (Data): 2x Intel® Xeon® Gold 6140 (2.30GHz, 18-core, 24.75 MB L3) 256 GiB Broadcom MEGARAID SAS 9361-8i 2x 600 GB 10.5K RPM SAS HDD 2x 1.6 TB NVMe SSD Mellanox MCX4121A-ACAT 25G
Connectivity Total Rack Units:	Mellanox MSN2010-CB2F 10/25GbE and 100GbE Switch (3x KTNF KR580S1) + (1x MSN201-CB2F) = (3x2) + (1x1) = 7 RU	

Machbase 5.7.3

TPCx-IoT	1.0.4
TPC Pricing	2.4.0
Report Date	Nov. 11, 2019

Description	Part Number	Source	List Price	Qty	Extended Price	3-year Maint. Price
Server Hardware						
1 x Master Node – KTNF KR580S1	KR580S1	1	$ 31,610.00	1	$ 31,610.00	
KR580S1 Barebone	-	1	(included)	1		
Intel Xeon Scalable Gold 6140 Processor	-	1	(included)	2		
64GB DDR4 2400 ECC RDIMM Memory	-	1	(included)	12		
600GB SAS HDD 10,500RPM	-	1	(included)	2		
Broadcom MEGARAID SAS 9361-8i RAID Card (1GB Cache)	-	1	(included)	1		
Mellanox MCX4121A-ACAT 25G Ethernet Adaptor	-	1	(included)	1		
KTNF 27" Monitor	-	1	(included)	1		
Trackball Mini Keyboard	-	1	(included)	1		
Maintenance - 7x24x4 Care Pack (3-yrs)	-	1	(included)	1		
2 x Data Node – KTNF KR580S1	KR580S1	1	$ 23,830.00	2	$ 47,660.00	
KR580S1 Barebone	-	1	(included)	1		
Intel Xeon Scalable Gold 6140 Processor	-	1	(included)	2		
64GB DDR4 2400 ECC RDIMM Memory	-	1	(included)	4		
600GB SAS HDD 10,500RPM	-	1	(included)	2		
Broadcom MEGARAID SAS 9361-8i RAID Card (1GB Cache)	-	1	(included)	1		
Intel P4610 1.6TB NVMe SSD	-	1	(included)	2		
Mellanox MCX4121A-ACAT 25G Ethernet Adaptor	-	1	(included)	1		
KTNF 27" Monitor	-	1	(included)	1		
Trackball Mini Keyboard	-	1	(included)	1		
Maintenance - 7x24x4 Care Pack (3-yrs)	-	1	(included)	1		
Server Hardware Sub Total					**$ 79,270.00**	
Network						
Mellanox MSN2010-CB2F 10/25GbE and 100GbE Switch	MSN2010-CB2F	2	$ 9,567.00	1	$ 9,567.00	
Mellanox MCP2M00-A003E30L Passive Copper Cable ETH up to 25Gb/s SFP28 3m Black 30AWG CA-L	MCP2M00-A003E30L	2	$ 64.00	3	$ 192.00	
Mellanox SUP-SN2000-3S-4H Technical Support and Warranty - Silver 3 Year with 4 Hours On-Site Support for SN2000 Series Switch	SUP-SN2000-3S-4H	2	$ 2,475.00	1		$ 2,475.00
Network Sub Total					**$ 9,759.00**	**$ 2,475.00**
Software						
rockPLACE CentOS Support Careepack - 3 Year 24x7, 4hr response	RSC-LSF3	3	$ 1,538.00	3		$ 4,614.00
Machbase v5.7.3 Cluster Edition (includes 1y 7x24x4 Technical Support)	-	4	$ 63,700.00	3	$ 191,100.00	
Machbase v5.7.3 Cluster Edition 7x24x4 Technical Support	-	4	$ 28,665.00	2		$ 57,330.00
Software Sub Total					**$ 191,100.00**	**$ 61,944.00**
Total					**$ 280,129.00**	**$ 64,419.00**

Pricing: 1 = KTNF Co. Ltd.; 2 = Mellanox Technologies, Ltd.; 3 = Rockplace Inc.; 4 = Machbase Inc.

* Discount applies to all line items where Source = 4.

Audited by Doug Johnson, InfoSizing

Three-Year Cost of Ownership: $344,548

IoTps: 1,043,276.60

USD/IoTps: $0.34

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated Line Items. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed Line Items. For complete details, see the pricing section of the TPC Benchmark Standard. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

	Machbase 5.7.3	TPCx-IoT	1.0.4
		TPC Pricing	2.4.0
		Report Date	Nov. 11, 2019

Numerical Quantities

Scale Factor	2100000000

Performance Run (Run2)

Warmup Run Start Time	2019-10-21 11:19:50.000
Warmup Run End Time	2019-10-21 11:54:10.000
Warmup Run Elapsed Time	2,059.186
Measured Run Start Time	2019-10-21 11:54:11.000
Measured Run End Time	2019-10-21 12:27:45.000
Measured Run Elapsed Time	2,012.889
Performance Metric (IoTps)	**1,043,276.60**

Repeatability Run (Run1)

Warmup Run Start Time	2019-10-21 10:11:50.000
Warmup Run End Time	2019-10-21 10:45:29.000
Warmup Run Elapsed Time	2,017.764
Measured Run Start Time	2019-10-21 10:45:29.000
Measured Run End Time	2019-10-21 11:18:32.000
Measured Run Elapsed Time	1,982.044
Performance Metric (IoTps)	1,059,512.30

Performance Run Report (Run2)

==========

TPCx-IoT Performance Metric (IoTps) Report

Test Run2 details : Total Time For Warmup Run In Seconds = 2,059.186

Test Run2 details : Total Time In Seconds = 2,012.889

Total Number of Records = 2100000000

TPCx-IoT Performance Metric (IoTps): 1043276.6039

==========

Repeatability Run Report (Run1)

==========

TPCx-IoT Performance Metric (IoTps) Report

Test Run1 details : Total Time For Warmup Run In Seconds = 2,017.764

Test Run1 details : Total Time In Seconds = 1,982.044

Total Number of Records = 2100000000

TPCx-IoT Performance Metric (IoTps): 1059512.3014

==========

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

	Machbase 5.7.3	TPCx-IoT	1.0.4
		TPC Pricing	2.4.0
		Report Date	Nov. 11, 2019

Revision History

Date	Edition	Description
November 11, 2019	First	Initial Publication

Table of Contents

Abstract 3
Executive Summary 3
Table of Contents 9
Clause 0 Preamble 10
0.1 TPC Express Benchmark™ IoT Overview 10
Clause 1 General Items 11
1.1 Test Sponsor 11
1.2 Parameter Settings 11
1.3 Configuration Diagrams 11
1.3.1 Measured Configuration 12
1.3.2 Priced Configuration 13
1.4 Dataset Distribution 13
1.5 Software Component Distribution 13
Clause 2 Workload Related Items 14
2.1 Hardware and Software Tunable Parameters 14
2.2 Run Report 14
2.3 Benchmark Kit Identification 15
2.4 Benchmark Kit Changes 15
Clause 3 Scale Factor and Metrics 16
3.1 Scale Factor, Performance, Price-Performance 16
Letter of Attestation 17
Third-Party Price Quotes 20
KTNF Co., Ltd 20
Mellanox Technologies, Ltd 21
Rockplace Inc 23
Machbase Inc. 24
Supporting File Index 25

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. Re-distribution 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.

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.

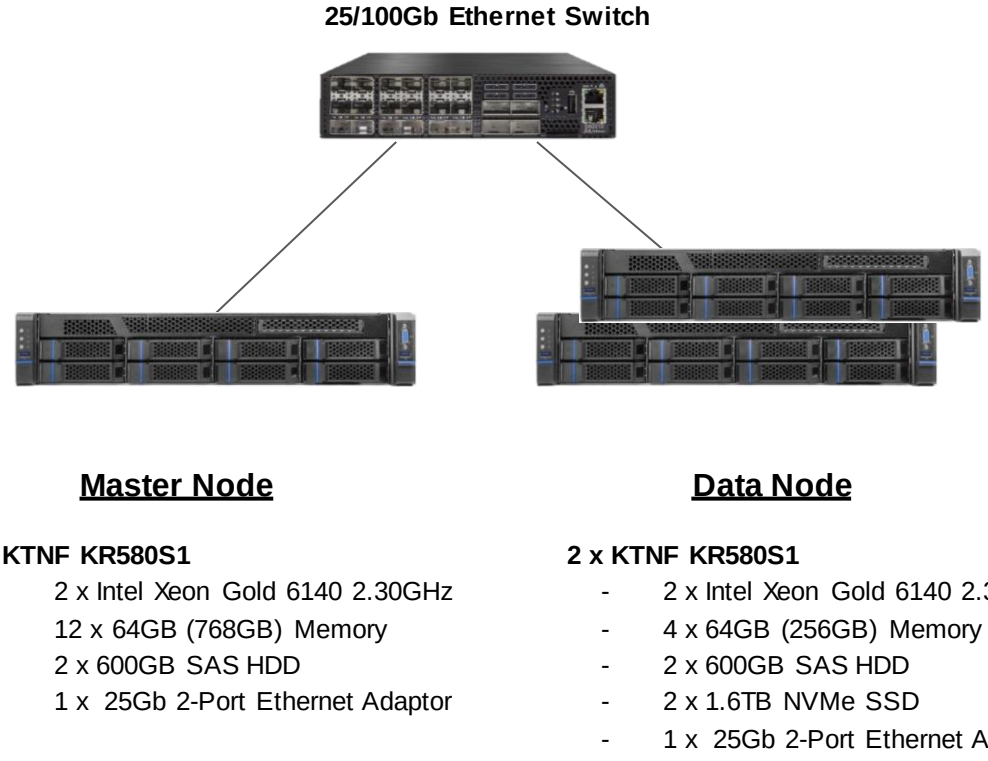


Figure 1-1 Measured Configuration

The measured configuration consisted of:

Total Nodes:	3	
Total Processors/Cores/Threads:	6/108/216	
Total Memory:	1.37	
Total Number of Storage Devices:	10	
Total Storage Capacity	10.00	
Connectivity:	Mellanox MSN2010-CB2F 10/25GbE and 100GbE Switch	
Servers	1x KR580S1 (Master):	2x KR580S1 (Data):
Processors/Cores/Threads:	2/36/72	2/36/72
Processor Model:	2x Intel® Xeon® Gold 6140 (2.30GHz, 18-core, 24.75 MB L3)	2x Intel® Xeon® Gold 6140 (2.30GHz, 18-core, 24.75 MB L3)
Memory:	768 GiB	256 GiB
Storage Controller:	Broadcom MEGARAID SAS 9361-8i	Broadcom MEGARAID SAS 9361-8i
Storage Devices:	2x 600 GB 10.5K RPM SAS HDD	2x 600 GB 10.5K RPM SAS HDD 2x 1.6 TB NVMe SSD
Network Controller:	Mellanox MCX4121A-ACAT 25G	Mellanox MCX4121A-ACAT 25G

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.

Server	Controller	Disk Drive	Description of Content
1	Megaraid SAS-3 3108	2 x SAS 600GB HDD	Machbase Broker, Operating System, Root, Swap
2, 3	Megaraid SAS-3 3108 U.2 PCIe Gen3	2 x SAS 600GB HDD 2 x 1.6TB NVMe SSD	Operating System, Root, Swap Machbase Data, coordinator

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.

Server	Broker	Coordinator	Warehouse
1	X		
2		X	X
3			X

Table 1-2 Software Component Distribution Across Nodes

The storage system software used was Machbase 5.7.3.

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)

```
================================================
TPCx-IoT Performance Metric (IoTps) Report
Test Run 1 details :    Total Time For Warmup Run In Seconds = 2,017.764
Test Run 1 details :    Total Time In Seconds = 1,982.044
                        Total Number of Records = 2100000000

TPCx-IoT Performance Metric (IoTps): 1059512.3014

================================================
```

Run Report for Run 2 (Performance Run)

```
================================================
TPCx-IoT Performance Metric (IoTps) Report
Test Run 2 details :    Total Time For Warmup Run In Seconds = 2,059.186
Test Run 2 details :    Total Time In Seconds = 2,012.889
                        Total Number of Records = 2100000000

TPCx-IoT Performance Metric (IoTps): 1043276.6039

================================================
```

2.3 Benchmark Kit Identification

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

TPCx-IoT Kit Version	1.0.4

File	MD5
TPC-IoT-master.sh	1dbe4d963fa7321e3df244913b3ef4ae
tpcx-iot/lib/core-0.13.0-SNAPSHOT.jar	7b8c3de667e60b96bd7611de0525ee65
IoT_cluster_validate_suite.sh	1d85705dc67fb3c767d7a1fe8775275f

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.

	Run 1	Run 2
Scale Factor	2100000000	2100000000
Measured Run Time (seconds)	1,982.044	2,012.889
IoTps	1,059,512.30	1,043,276.60

Run2 Price-Performance: 0.34 $/IoTps.

Letter of Attestation

The auditor's agency name, address, phone number, and Attestation letter must be included in the full disclosure report. A statement should be included specifying who to contact in order to obtain further information regarding the audit process.

This benchmark was audited by Doug Johnson, InfoSizing.

www.sizing.com
63 Lourdes Drive
Leominster, MA 10453
978-343-6562

This benchmark's Full Disclosure Report (FDR) can be downloaded from www.tpc.org.

A copy of the auditor's Letter of Attestation follows.

InfoSizing
The Right Metric For Sizing IT

TPC
Certified Auditor

Kihan Choi
Research Engineer
Telecommunications Technology Association (TTA)
Bundang-ro 47, Bundang-gu, Seongnam-city
Gyeonggi-do, 13591, Republic of Korea

October 31, 2019

I verified the TPC Express Benchmark™ IoT v1.0.4 performance of the following configuration:

Platform:	KTNF KR580S1 (3x KR580S1)
Operating System:	CentOS Linux 7.6.1810
Storage Software:	Machbase 5.7.3

The results were:

Performance Metric	**1,043,276.60 IoTps**
Run Elapsed Time	2,012.889 Seconds

Cluster	**3x KTNF KR580S1, each with:**		
CPUs	2x Intel® Xeon® Gold 6140 (2.30 GHz, 18-core, 24.75 MB L3)		
Memory	768 GiB (Master node)		
	256 GiB (Data nodes)		
Storage	***Qty***	***Size***	***Type***
	2	600GB	10.5K RPM SAS HDD (All nodes)
	2	1.6TB	NVMe SSD (Data nodes)

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark.

The following verification items were given special attention:

- All TPC-provided components were verified to be v1.0.4
- No modifications were made to any of the Java code
- Any and all modifications to shell scripts were reviewed for compliance
- All checksums were validated for compliance
- The generated dataset was properly scaled to 2100000000 rows
- The dataset was protected with a minimum of two-way replication

63 Lourdes Dr. | Leominster, MA 01453 | 978-343-6562 | www.sizing.com

- The elapsed times for all phases and runs were correctly measured and reported
- The system pricing was verified for major components and maintenance
- The major pages from the FDR were verified for accuracy

Additional Audit Notes:

None.

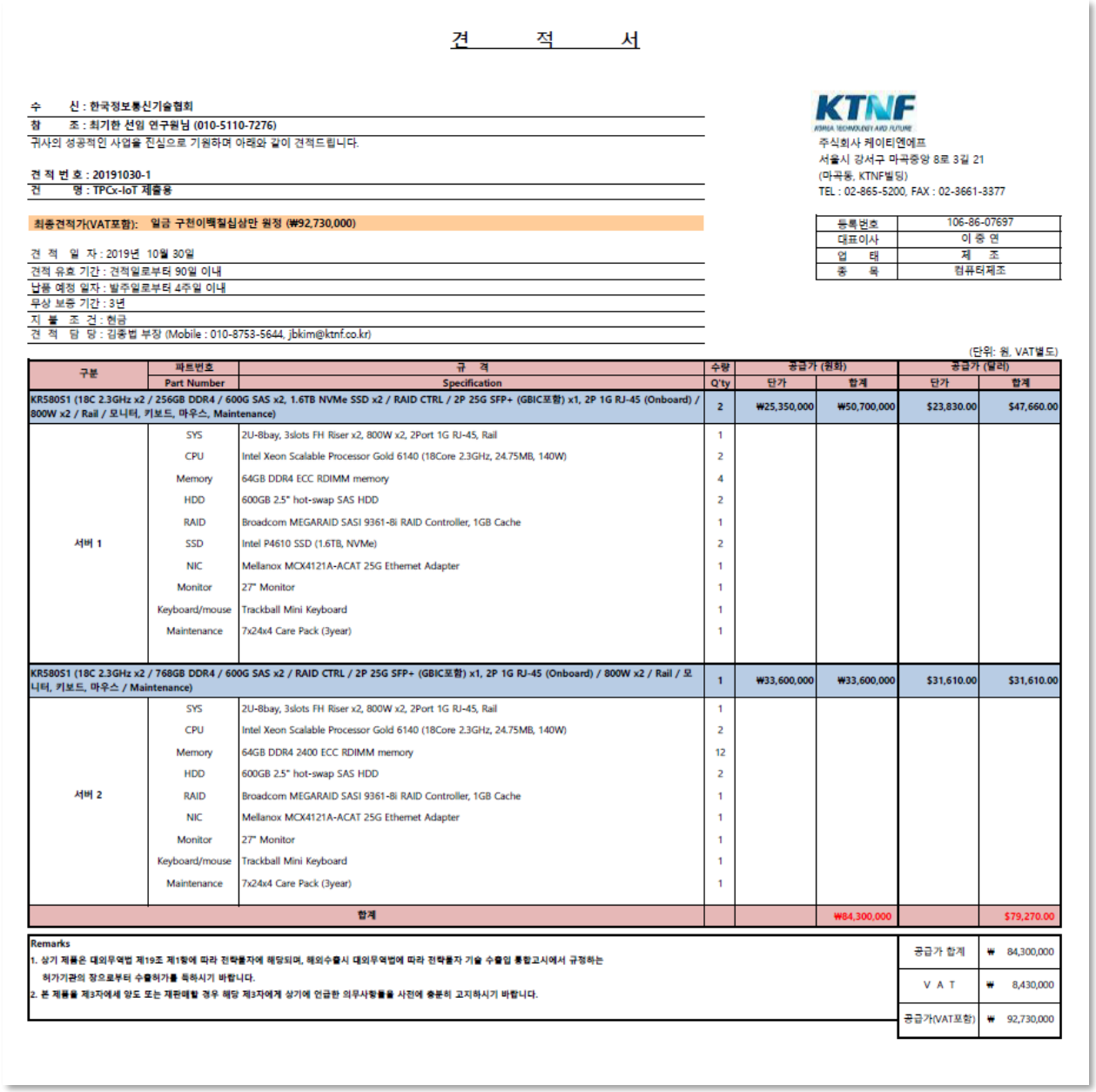
Respectfully Yours,

Doug Johnson, Certified TPC Auditor

63 Lourdes Dr. | Leominster, MA 01453 | 978-343-6562 | www.sizing.com

Third-Party Price Quotes

KTNF Co., Ltd



견 적 서

수 신 : 한국정보통신기술협회
참 조 : 최기한 선임 연구원님 (010-5110-7276)
귀사의 성공적인 사업을 진심으로 기원하며 아래와 같이 견적드립니다.

견 적 번 호 : 20191030-1
건 명 : TPCx-IoT 제출용

최종견적가(VAT포함): 일금 구천이백칠십삼만 원정 (₩92,730,000)

견 적 일 자 : 2019년 10월 30일
견적 유효 기간 : 견적일로부터 90일 이내
납품 예정 일자 : 발주일로부터 4주일 이내
무상 보증 기간 : 3년
지 불 조 건 : 현금
견 적 담 당 : 김종법 부장 (Mobile : 010-8753-5644, jbkim@ktnf.co.kr)

KTNF
KOREA TECHNOLOGY AND FUTURE
주식회사 케이티엔에프
서울시 강서구 마곡중앙 8로 3길 21
(마곡동, KTNF빌딩)
TEL : 02-865-5200, FAX : 02-3661-3377

등록번호	106-86-07697
대표이사	이 중 연
업 태	제 조
종 목	컴퓨터제조

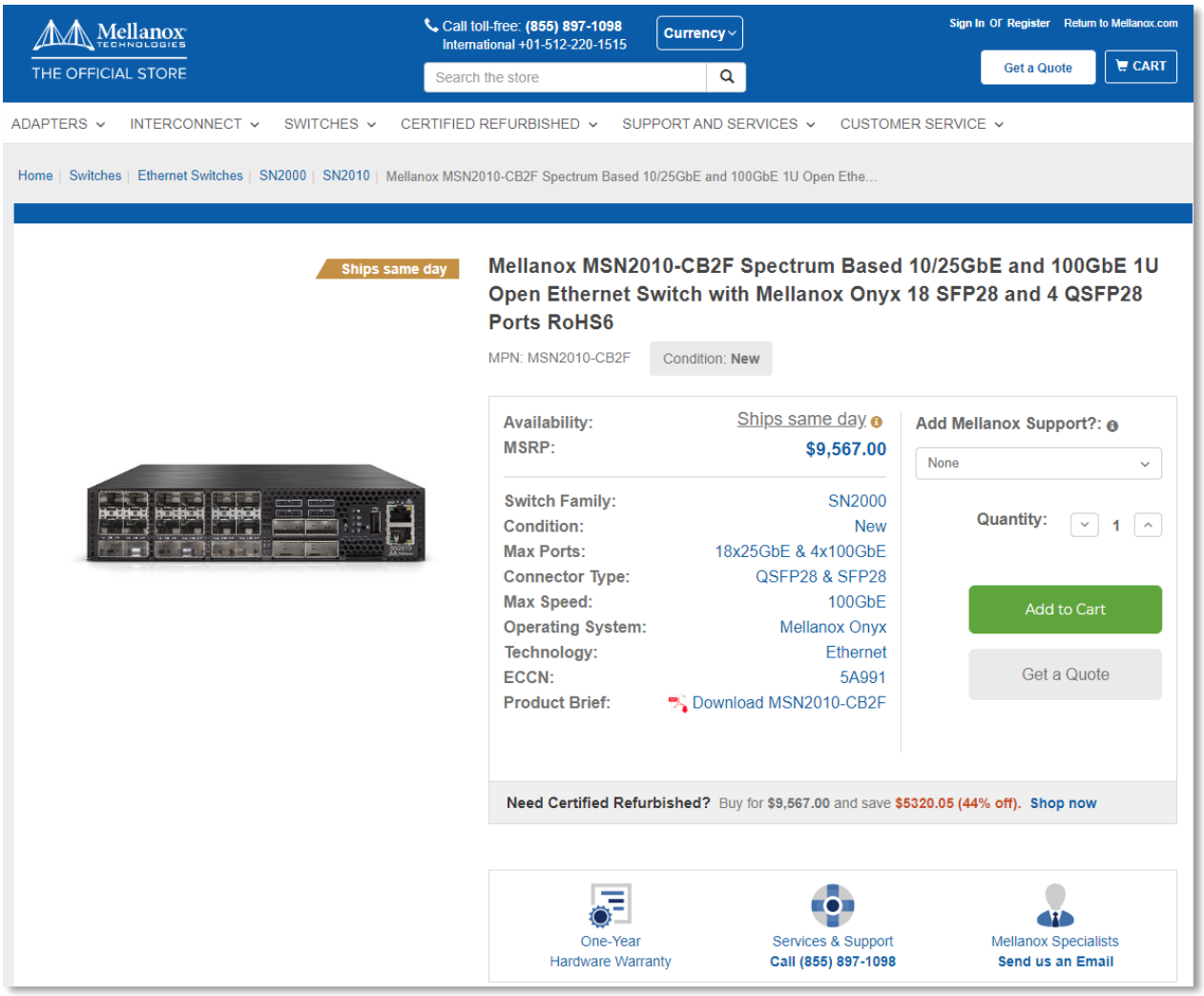
(단위: 원, VAT별도)

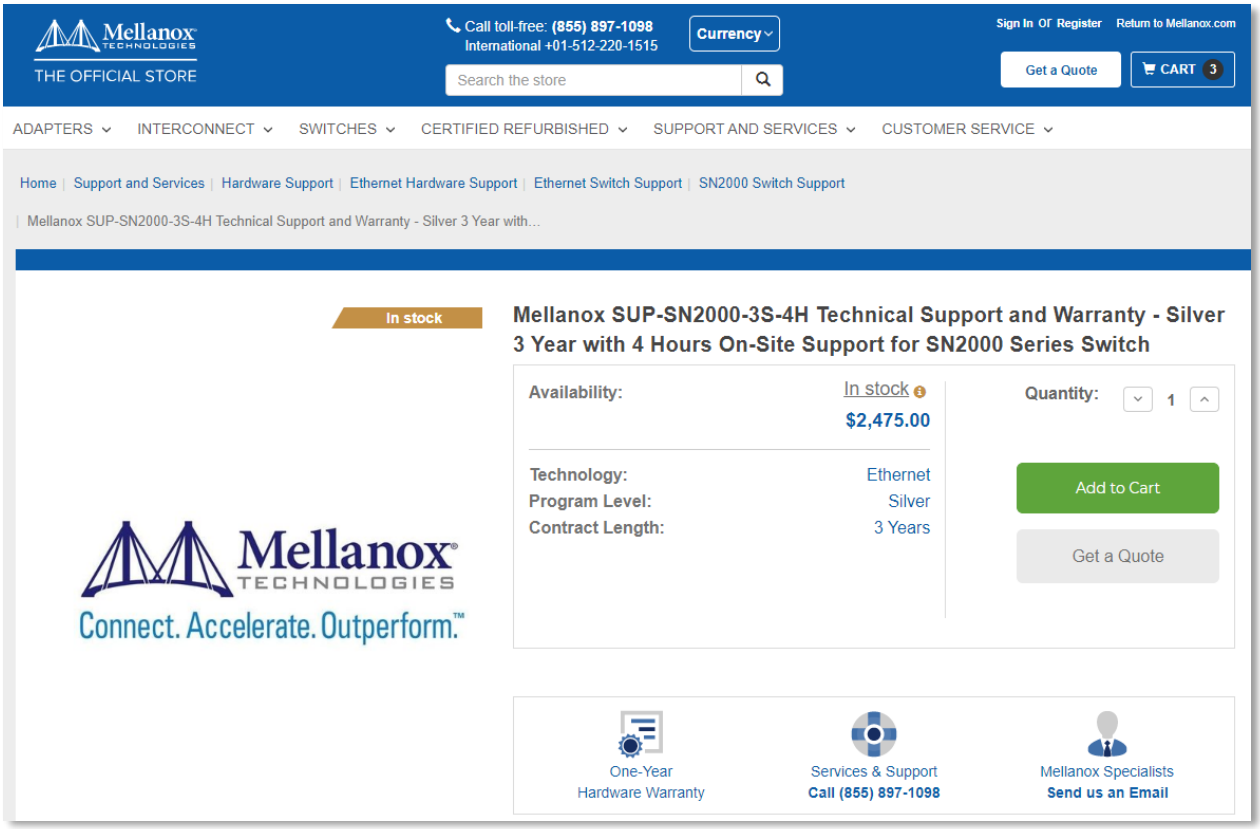
구분	파트번호 Part Number	규 격 Specification	수량 Q'ty	공급가 (원화) 단가	공급가 (원화) 합계	공급가 (달러) 단가	공급가 (달러) 합계
KR580S1 (18C 2.3GHz x2 / 256GB DDR4 / 600G SAS x2, 1.6TB NVMe SSD x2 / RAID CTRL / 2P 25G SFP+ (GBIC포함) x1, 2P 1G RJ-45 (Onboard) / 800W x2 / Rail / 모니터, 키보드, 마우스, Maintenance)			2	₩25,350,000	₩50,700,000	$23,830.00	$47,660.00
서버 1	SYS	2U-8bay, 3slots FH Riser x2, 800W x2, 2Port 1G RJ-45, Rail	1				
	CPU	Intel Xeon Scalable Processor Gold 6140 (18Core 2.3GHz, 24.75MB, 140W)	2				
	Memory	64GB DDR4 ECC RDIMM memory	4				
	HDD	600GB 2.5" hot-swap SAS HDD	2				
	RAID	Broadcom MEGARAID SASI 9361-8i RAID Controller, 1GB Cache	1				
	SSD	Intel P4610 SSD (1.6TB, NVMe)	2				
	NIC	Mellanox MCX4121A-ACAT 25G Ethernet Adapter	1				
	Monitor	27" Monitor	1				
	Keyboard/mouse	Trackball Mini Keyboard	1				
	Maintenance	7x24x4 Care Pack (3year)	1				
KR580S1 (18C 2.3GHz x2 / 768GB DDR4 / 600G SAS x2 / RAID CTRL / 2P 25G SFP+ (GBIC포함) x1, 2P 1G RJ-45 (Onboard) / 800W x2 / Rail / 모니터, 키보드, 마우스 / Maintenance)			1	₩33,600,000	₩33,600,000	$31,610.00	$31,610.00
서버 2	SYS	2U-8bay, 3slots FH Riser x2, 800W x2, 2Port 1G RJ-45, Rail	1				
	CPU	Intel Xeon Scalable Processor Gold 6140 (18Core 2.3GHz, 24.75MB, 140W)	2				
	Memory	64GB DDR4 2400 ECC RDIMM memory	12				
	HDD	600GB 2.5" hot-swap SAS HDD	2				
	RAID	Broadcom MEGARAID SASI 9361-8i RAID Controller, 1GB Cache	1				
	NIC	Mellanox MCX4121A-ACAT 25G Ethernet Adapter	1				
	Monitor	27" Monitor	1				
	Keyboard/mouse	Trackball Mini Keyboard	1				
	Maintenance	7x24x4 Care Pack (3year)	1				
합계					₩84,300,000		$79,270.00

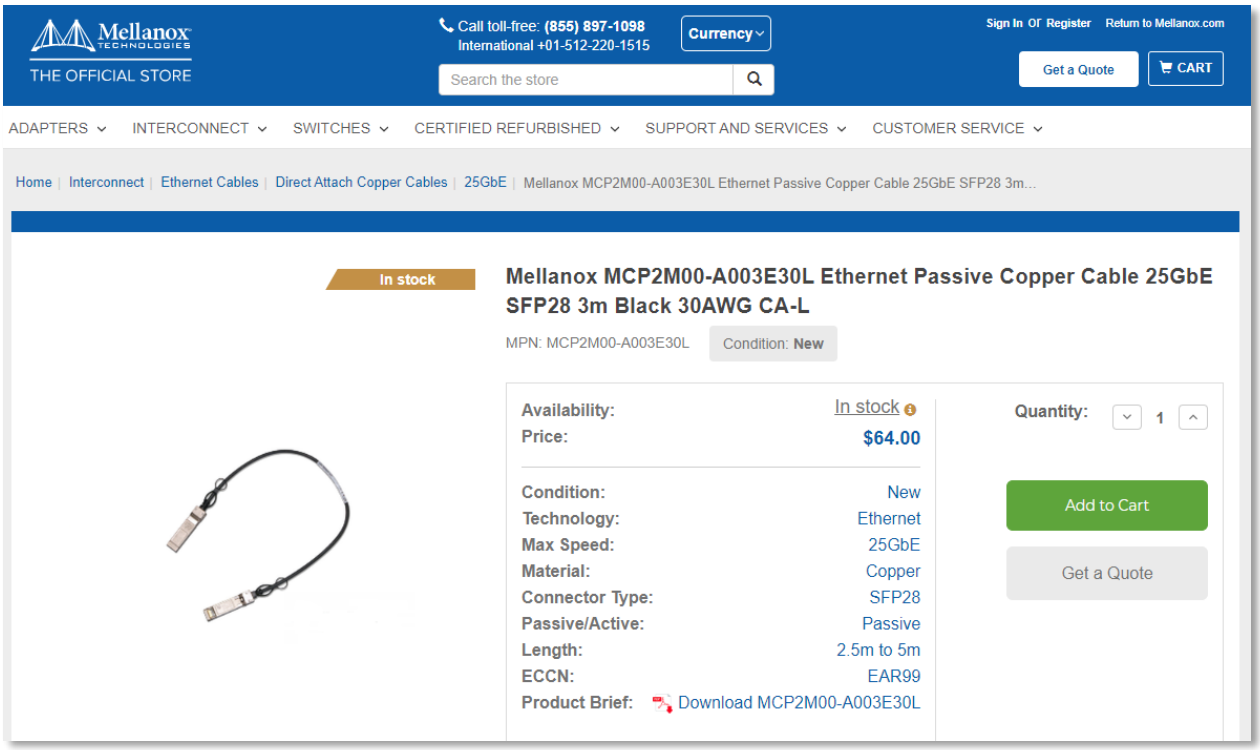
Remarks
1. 상기 제품은 대외무역법 제19조 제1항에 따라 전략물자에 해당되며, 해외수출시 대외무역법에 따라 전략물자 기술 수출입 통합고시에서 규정하는 허가기관의 장으로부터 수출허가를 득하시기 바랍니다.
2. 본 제품을 제3자에게 양도 또는 재판매할 경우 해당 제3자에게 상기에 언급한 의무사항들을 사전에 충분히 고지하시기 바랍니다.

공급가 합계	₩ 84,300,000
V A T	₩ 8,430,000
공급가(VAT포함)	₩ 92,730,000

Mellanox Technologies, Ltd




Mellanox TECHNOLOGIES
THE OFFICIAL STORE
Call toll-free: (855) 897-1098
International +01-512-220-1515
Currency
Search the store
Sign In Or Register
Return to Mellanox.com
Get a Quote
CART 3
ADAPTERS
INTERCONNECT
SWITCHES
CERTIFIED REFURBISHED
SUPPORT AND SERVICES
CUSTOMER SERVICE
Home | Support and Services | Hardware Support | Ethernet Hardware Support | Ethernet Switch Support | SN2000 Switch Support
| Mellanox SUP-SN2000-3S-4H Technical Support and Warranty - Silver 3 Year with...
In stock
Mellanox SUP-SN2000-3S-4H Technical Support and Warranty - Silver 3 Year with 4 Hours On-Site Support for SN2000 Series Switch
Availability:
In stock
$2,475.00
Quantity:
1
Technology:
Ethernet
Program Level:
Silver
Contract Length:
3 Years
Add to Cart
Get a Quote
Mellanox TECHNOLOGIES
Connect. Accelerate. Outperform.™
One-Year
Hardware Warranty
Services & Support
Call (855) 897-1098
Mellanox Specialists
Send us an Email


Mellanox TECHNOLOGIES
THE OFFICIAL STORE
Call toll-free: (855) 897-1098
International +01-512-220-1515
Currency
Search the store
Sign In Or Register
Return to Mellanox.com
Get a Quote
CART
ADAPTERS
INTERCONNECT
SWITCHES
CERTIFIED REFURBISHED
SUPPORT AND SERVICES
CUSTOMER SERVICE
Home | Interconnect | Ethernet Cables | Direct Attach Copper Cables | 25GbE | Mellanox MCP2M00-A003E30L Ethernet Passive Copper Cable 25GbE SFP28 3m...
In stock
Mellanox MCP2M00-A003E30L Ethernet Passive Copper Cable 25GbE SFP28 3m Black 30AWG CA-L
MPN: MCP2M00-A003E30L
Condition: New
Availability:
In stock
Price:
$64.00
Quantity:
1
Condition:
New
Technology:
Ethernet
Max Speed:
25GbE
Material:
Copper
Connector Type:
SFP28
Passive/Active:
Passive
Length:
2.5m to 5m
ECCN:
EAR99
Product Brief:
Download MCP2M00-A003E30L
Add to Cart
Get a Quote

Rockplace Inc.

rockPLACE
(주)락플레이스 www.rockplace.co.kr

㈜락플레이스
135-120 서울시 강남구 신사동 634-10 윤당빌딩 3층 Tel.02)6251.7788 Fax.02)6251.6677

rockPLACE, Inc.
3F, Yundang bldg, 634-10, Shinsa-dong, Gangnam-gu,Seoul, Korea Tel : 822-6251-7788 Fax: 822-6251-6677

견 적 서

REF No.	: 2019RP10-2303	TERMS AND CONDITION	
DATE	: 2019. 10 23.		
COMPANY	: TTA	납 기	: 발주후 4주이내
ATTN	: 이 태 석 선임 연구원님 귀하 TEL : 010-5110-6295	유지보수	: 납품일로부터 3년
Email	: nason927@tta.or.kr	결제조건	: 익월말 현금
FROM	: ㈜ 락플레이스 정 경환 차장 TEL : 010-4298-3447	유효기간	: 견적일로부터 1개월

下記와 같이 見積합니다.

㈜ 락플레이스
대표이사 서 동 식

ITEM DESCRIPTION (VAT 별도, 단위 : $)

Part No.	Description	수량	소비자가	공급단가	공급합계
연간기술지원	연간 방문 기술지원 (옵션)				
RSC-LSF3	rockPLACE Support Carepack - Linux Standard (3년) per Server 3 Year, 24x7, 4hr response 기술지원 대상 : Cent OS 이메일, 전화, 원격지원, 현장지원 서비스 - Problem tracking/Emergency assistance - Update, Patch 작업 지원 - 서비스, 시스템 환경, 네트워크 환경 설정 변경 지원 - 인수 시험, 성능 시험, 비상 복구 훈련 지원 - MRG Realtime 기술지원 포함	3	4,614	1,538	4,614
소 계 금 액(Sub Total)					4,614

합 계	4,614
부가세(VAT)	461
합 계(부가세 포함, with VAT)	5,075

Remarks

1. Cent OS의 경우 벤더가 없는 커뮤니티 Linux로 L1,L2 레벨의 기술지원만 가능하며, 벤더(L3 레벨) 기술지원은 불가 합니다.
2. 발주 시에는 반드시 고객정보(엔드유져명, 담당자, 연락처, Email)가 있어야 합니다.
3. OnSite 방문지원이 필요하실 경우에는 케어팩을 구매하셔야 합니다.

Machbase Inc.

Quotation

Doc. No.	: MACH-SALES-20191025-01	Business License	120-87-96403		
Date	: 2019-10-25	Company	Machbase Inc.	CEO	Andrew Kim
To	: TTA	BusinessTerritory	Service, Business Service	ProductType	Software
CC	: Mr. Ki Han Choi	Address	Rn. 904, 273 Digital-ro, Guro-gu		
Charge	: Director. Kwang Hoon Shim (+82-10-9910-8086)		Seoul, Korea		
Here we quote as belows		Tel.	T : 02-2109-5607	F : 02-2038-4607	
Quote	273,273	USD (VAT Incl.)			

No.	Content	List Price (USD/Node)	Unit Price (USD/Node)	Quantity (Node)	Supply Price (USD)	Tax. Incl. (USD)
1	**Machbase Cluster Edition V5.7.3**	98,000	63,700	3	191,100	210,210
	Machbase Run-Time License					
	Machbase Time Series DBMS					
	Machbase Client Developmet Kit					
	Machbase Coordinator					
	Machbase Broker					
	Machbase Warehouse					
	Machbase Web Admin					
	Machbase Tag Analyzer					

No.	Content	Ref. Price (USD)	Maintenance Rate (%)	Total Period (Year)	Supply Price (USD)	Tax. Incl. (USD)
2	**Maintenance**	191,100	15%	2.00	57,330	63,063
	Support & On-site Guide					
	Fault Handling					
	API Connection					
	Guide for Server & Node Configuration					
Total					248,430	273,273

<< REMARK >>

.- Here is a quote for applying a Machbase time series database for TTA.

.- Quotation : Machbase Cluster Edition Run-Time License 3Nodes 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 90 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 seperately guided with DB Professional Service.

.- Quotation validity period: 90 days from the date of quotation

MACHBASE

Supporting File Index

Clause	Description	Archive Pathname
Clause 1	Parameters and options used to configure and tune the SUT	/Clause1
Clause 2	Configuration scripts and Run Report	/Clause2
Clause 3	System configuration details	/Clause3