TPC Pricing Specification

Standard Specification
Version 1.2.0

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Acknowledgments

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Document History

Date	Version	Description
February 16, 2005	1.0.0	Version 1.0.0 approved by mail ballot of the TPC membership
April 13-June 27, 2005	1.0.1	minor text updates from 4/13/05 through 6/27/05 – updated index, improved clause references
March 1, 2006	1.1	Altered hardware orderability requirement in 7.1.2.1
May 1, 2006	1.1	Included many clause changes to both improve consistency with the March 1, 2006 change and to improve verifiability of pricing of components that are not orderable.
December 11, 2006	1.1.0_A	Change to 7.1.2.3 and related clauses to change 6 months to 185 days
February 6, 2007	1.2.0	Changes to 8.3.3 associated with rules for substitution

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Note: Clauses 1-6 have been left out of this specification because they are typically used for requirements that are not price-related in TPC benchmark specifications. Clauses that are related to pricing have traditionally been:

Clause 0 - Preamble

Clause 7 – Pricing

Clause 8 – Full Disclosure Report

Clause 9 – Audit Requirements.

To retain consistency with benchmark specifications, these labels are used in this document as well.

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Clause 0: PREAMBLE

0.1 Introduction

0.1.1 Purpose

TPC Benchmarks™ are intended to provide a fair and honest comparison of various vendor implementations to accomplish an identical, controlled and repeatable task. The pricing for these implementations must also allow a fair and honest comparison for customers to review. The Transaction Processing Performance Council is providing this specification to guide the customer, the vendors implementing a benchmark, and the auditors on what is acceptable pricing for the purposes of publication. It is not attempting to dictate or exclude business practices in the marketplace. There may be some restrictions on pricing for publication (such as excluding sales and closeouts) that are different from some business transactions that actually take place in the marketplace, but those restrictions are intended to make publication both tractable and comparable during the lifetime of the publication for the majority of customers and vendors.

0.1.2 Definitions

Any customer. – No potential **customer** will be excluded.

Archive Operation Requirement. The period of time for which data generated by the **Priced Configuration** as required by the benchmark specification must be maintained in on-line storage.

Available. A product is **available** if it is **orderable** and is shipping to customers.

Availability Date. The date when the all components of the system under test are **generally available**.

Benchmark Special pricing. – A price that is submitted for publication that uses methods or values that would not likely be found in an actual purchase agreement with a **customer**, as defined here in Clause 0.1.2.

Commercially Available Product. A product that:
1. Is orderable,
2. Is maintained as defined in this specification,
3. Has a non-zero price for at least one of purchase, license or maintenance support, and
4. Is designed for customer uses other than running the benchmark.

Component. The term, "**component**" is used often in this specification. It is used to designate an element of the system or subsystem being discussed without any specific relationship to whether it is a specific **line item**, a part of a bundled **line item** or a bundle of other elements of the configuration. For example, a power cord is a component that may be separately priced as a **line item** with a **part number** or may be included in the price of a larger component.

Continuous Operation Requirement. The period of time when the **Priced Configuration** must be able to support the full operation at the performance levels claimed in the benchmark.

Customer. An individual or business that could plausibly and legally purchase the products listed in the **FDR**.

Defect. – A behavior of the system that prevents the normal operation of the customer's application.

Discount. A reduction in price from the **List Price** of a **Line Item** or group of **Line Items**.

Failure. A condition that prevents the system under test from performing benchmark operations at the performance and functional levels required by the benchmark specification and claimed in the **FDR**.

FDR. See definition in official TPC Policies document.

Fix. Any resolution (including "workarounds") that restores the application to normal operation.

Generally Available. A product is **available** to **any customer**.

List Price. The price for which a vendor would sell one unit of an item to **any customer** without any other purchase (other than specific prerequisite or other required products that are documented in association with the product).

Line Item. A product, service, license, or bundle of any or all of these in an entity that is uniquely identified by a **part number**.

Maintenance Response Time. Response time means the elapsed time it takes from customer request until an active resolution of the problem is under way by a qualified person. There must be ownership of the problem. Simply having it in a queue is not sufficient. The start of a **defect** resolution process that includes direct interaction with the customer or their computer must be underway. The resumption of customer operations need not be guaranteed within the response period. The maintenance provider will perform the procedures for final resolution of the problem.

Orderable. A method exists for the specified sales channel and a **customer** to establish a purchase agreement for the product at a specific price.

Part Number. An alphanumeric string used by a supplier to uniquely identify a priced **component** of a **Priced Configuration**. The **Sales Channel** should be able to identify the **component** by the **part number** when generating a price.

Priced Configuration. The **components** to be priced defined in the benchmark specification, including all hardware, software and maintenance.

Pricing. The methods and documentation used to obtain a final price for the **Priced Configuration**, including all items specified in Clause 7.

Pricing Model. The algorithm or process used by a vendor to set or compute prices. There can be many **pricing models** within a single vendor pertaining to the same products or group of products. **Pricing models** are often aimed at specific markets.

Pricing source. A group or individual that would normally generate a price quotation for the **sales channel** specified in the **FDR**. For example, if the **sales channel** is a web-based tool that automatically generated a price quotation, then the **Pricing source** is that tool.

Pricing Spreadsheet. The **Pricing Spreadsheet** is a table that lists the individually priced **components** of the **Priced Configuration**, along with the source of the price, the computation of extended price including quantities and any applied **discounts**, and the price totals (See Clause 7.4.1).

Real-world pricing. The price that customers would pay in a real sales situation.

Result. See definition in official TPC Policies document.

Sales channel. The organization or tool that enters into a purchase agreement with a **customer**. For example, the **sales channel** could be a web-based tool, a particular sales organization, or a general sales organization.

Similar Configuration. A configuration is "similar" if the quantities of the **components** in the configuration are at least the quantities shown in the **FDR** of the result and no more than 10 percent more than those quantities.

Similar Discount. A **discount** is "similar" if the value (in the priced currency) of the **discount** for a **similar configuration** is at least as much as it is in the FDR of the result.

Third Party (3rd Party). A company that provides a **line item** priced in the benchmark and that is neither the primary test sponsor (first party) nor the customer (second party). In the situation where more than one company are sponsors of a benchmark, only one of these may be considered the primary test sponsor and the other(s) must be treated as **3rd parties**.

0.1.3 Basic Requirements

To meet the requirements of being fair, honest and comparable, while allowing for a variety of **pricing** and business strategies, the following requirements exist for the **pricing** information in all TPC Benchmark publications:

1. Pricing must be based upon some **pricing model** that the sponsoring company actually employs with customers.
   a. The published price must be a price that **any customer** would pay for the **priced configuration**.
   b. The methodology used must generate a similar price for a similar configuration for **any customer.**

2. Pricing must be verifiable. In a competitive environment, aggressive discounting may occur in certain situations. The **pricing model** employed for TPC Benchmark publications might not represent the best or lowest price some customer would pay. The **pricing model** must represent the **pricing** that could be obtained by **any customer** in a request for bid to a single vendor. Situations that occur when requests for bids go out to multiple vendors and then those bids are used in multiple negotiations to get a better price are not being represented.

Benchmark sponsors are permitted several possible **pricing models** to construct a price for the **priced configuration.** The **Pricing Models** used must adhere to Clause 7 and the **Pricing Spreadsheet** must be formatted to adhere to the disclosure requirements in Clause 8 as illustrated in the appendix.

0.1.4 Binding Sections of the Specification

Every portion of this specification (including comments and appendices) must be satisfied by any **pricing model** used for publication, unless the portion is expressly identified as non-binding.

0.1.5 Specification Precedence

0.1.5.1   If there is a conflict between the benchmark specification and the pricing specification, the pricing specification is the controlling document. The benchmark maintenance subcommittee is required to bring any issues with the pricing specification to the pricing maintenance subcommittee for resolution. The benchmark maintenance and pricing maintenance subcommittees shall cooperate to resolve the conflict.

0.1.5.2   If there is a conflict that is not explicitly called out in the benchmark specification, the pricing specification wording prevails.

0.1.5.3   If there is language in the pricing specification and not in the benchmark specification, the pricing specification prevails.

0.1.5.4   If there is language in the benchmark specification and not in the pricing specification, the benchmark specification prevails.

0.2 General Pricing Guidelines

0.2.1 Pricing in the Marketplace

The purpose of TPC benchmarks is to provide relevant, objective information to industry users. To achieve that purpose, publication of a TPC benchmark requires **pricing** that:

1. Is no lower than what would be quoted to **Any customer** from the date of publication of the **FDR**.

2. Is actively used by the vendor in the market segment that the **pricing** models or represents (e.g., small business customers, or large corporations, depending on the type of system being priced).

3. A significant number of customers in the market segment that the **pricing** models or represents would plausibly receive in a purchase agreement.

Comment: The same product may be priced differently through different sales channels. The price specified in the benchmark result must be **available** to **any customer** within the sales channel used for the result.

0.2.2 Benchmark Specials

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

The following characteristics, while not exhaustive, should be used as a guide to judge whether a particular **pricing** used is a **benchmark special**. It is not required that each point below be met, but that the cumulative weight of the evidence be considered to identify unacceptable **pricing**. Absolute certainty or certainty beyond a reasonable doubt is not required to make a judgment on this complex issue. The question that must be answered is this: based on the available evidence, does the clear preponderance (the greater share or weight) of evidence indicate that this **pricing** is a **benchmark special**?

1. Is the **pricing** not documented (publicly or privately) or are there restrictions that prevent **any customer** from obtaining the price?

2. Is the **pricing model** used inconsistently with customers that purchase from the specified sales channels?

3. Is the price restricted to a customer set with volume-based negotiated prices, such as GSA, OEM, channel partner, or wholesale **pricing**?

4. Does the **pricing** have significant restrictions that limit its use or applicability beyond TPC benchmarks?

a. If the specific TPC **Priced Configuration** or a part of the **Priced Configuration** is priced as a bundle, are there no similar bundles available for other configurations?

b. Is the **discount** applied and the amount of the **discount** unavailable for all similarly priced, similarly marketed, or other similar models.

5. Does the **pricing** take special advantage of the limited nature of TPC benchmarks (e.g., software components required, or limited use of maintenance) in a manner that would not be generally applicable to the real-world environment the benchmark represents?

6. Is the use of the **pricing** discouraged by the vendor?

7. Does the **pricing model** require uncommon sophistication on the part of the **customer**? For example, is a **discount** only available to **customers** who engage in extensive negotiations and who place competitor's bids against the pricing agent? For example, is a **customer** unable to receive a **similar discount** for a **similar configuration** when presenting the contact at the disclosed **sales channel** with the **pricing** information in the **FDR**?

8. Is the **pricing** unusual or non-customary for the vendor or unusual or non-customary to normal business practices? The following **pricing** practices are suspect:

a. Availability of a **discount** to a small subset of customers who would normally purchase the kind of system being priced.

b. Unusual or non-customary restrictions on transferability of product, warranty or maintenance on discounted items.

Clause 7: PRICING

7.1 Pricing Methodology

The intent of this section is to define the methodology to be used to calculate the 3-year price and the price/performance of the benchmark . The **pricing** methodology specified below must reflect the price for the purchase of the system under test, the licensing of software used in the benchmark, and the contracts for maintenance. **Pricing** may use packages and **discounts** that are **generally available**. The prices must be disclosed in a **line item** fashion using **pricing** in the currency of a country where the **Priced Configuration** is **generally available**.

The prices used in the benchmark must be for outright purchase of hardware and of licenses to use software. Lease agreements are not allowed.

All prices must be verifiable from the date of publication of the FDR."

7.1.1 Priced Components

The **components** to be priced are the **Priced Configuration** defined in the benchmark specification and the maintenance on those **components** (see Clause 7.3).

7.1.2 Product Availability

The benchmarked system is the actual system that the customer would purchase. However, it is realized that vendors may announce new products and disclose benchmark results before the products have actually shipped to customers. This is allowed, but any use of benchmark-special implementations is specifically disallowed (see Clause 0.2).

7.1.2.1   All hardware used in the calculations must be **orderable** by **any customer** on the **availability date**. All software used in the calculations must be either **orderable** by customers from the day of publication, or the sponsor must disclose the **availability date** and the means for obtaining the item by the **availability date**.

7.1.2.2   For any hardware or software product that is not currently **orderable**, **any customer** must be able to order some product from the same vendor that is of the same type and has similar capabilities as the product used in the result. The means for ordering the existing product must be the same as the means disclosed by the sponsor for the product used in the result.

Comment 1: A supplier with an existing software product, such as a computer, server, storage, database, transaction monitor, or operating system, may price a newly announced product offering that is not currently orderable. A supplier that has not offered a predecessor product in the past must make the product fully orderable prior to its inclusion in an FDR.

Comment 2: For each of the components that are not orderable on the report date of the FDR, the following information must be included in the FDR:
- Name and part number of the item that is not orderable
- The date when the component can be ordered (on or before the **Availability Date**)
- The method to be used to order the component (at or below the quoted price) when that date arrives
- The method for verifying the price

7.1.2.3 The **Availability Date** must be within 185 days of the full disclosure report (**FDR**) submittal date.

7.1.2.4 A Non-disclosure Agreement or other restriction that prevents **any customer** from ordering any priced line item disclosed in an FDR is not allowed.

Comment: The presence of an NDA does not mean that obtaining the pricing is exclusionary. The actual NDA needs to be examined to determine exclusionary pricing. For instance, there are types of NDA's in an End-User Licensing Agreement (EULA) which prevent end users from disclosing certain things learned about a product.

7.1.3 Packages, Discounts

7.1.3.1 **Generally Available** discounts for the **Priced Configuration** are allowed. The priced items over which a discount applies must be specified (see Clause 8.1.2.2).

7.1.3.2 **Generally Available** packaged **pricing** is allowed. (Packages must adhere to the requirements of Clause 0.2.)

Comment: The intent of the pricing methodology is to allow packaging and pricing that is **Generally Available** to customers and to explicitly exclude closeouts, promotional pricing and/or limited time offerings.

7.1.3.3 Assumptions of other purchases, other sites with similar systems, or any other assumption that relies on the principle that the customer has made or will make any other purchase from the vendor are prohibited.

7.1.3.4 **Discounts** that are associated with only a subset of the components of the **Priced Configuration** must be independent of the configuration and quantities of the other components of the configuration. For example, a **discount** applied specifically to storage must be **Generally Available** for the storage priced, regardless of what system or software is configured.

7.1.3.5 **Discounts** that are based on terms that require payment faster than 30 days after invoicing are prohibited.

7.1.3.6 Revenue **discounts** based on total price are allowed. Any **discount** must be only for the **Priced Configuration** being priced and cannot be based on past or future purchases. Individually negotiated **discounts** are prohibited. Special customer **discounts,** such as GSA (U.S. General Services Administration) schedule or an educational schedule, are prohibited.

7.1.3.6 Maintenance **pricing** must cover a period of 3 years.

Comment 1: Maintenance **pricing** indicates a purchase of future services. There are many ways that customers purchase maintenance. Among the valid combinations for pricing of maintenance are: warranty coverage for 3 years, 3-year maintenance packaged pricing, warranty coverage for one year and monthly maintenance for an additional 24 months, warranty coverage for 2 years and an additional year of maintenance, or any of the above with a **discount** for prepayment.

Comment 2: Any warranty coverage that is used to satisfy the maintenance requirement must meet the requirements for response time as defined in Clause 7.3.

7.1.3.7   Local pricing and **discount** structures must be available in each country for which results are published.

7.1.3.8   All hardware components used in the priced system must be new (i.e., not reconditioned or previously owned).

Comment: While pricing may not be based on past or future purchases, there is no restriction on whether the purchase of the **Priced Configuration** will affect the price of future purchases by the **customer** (e. g. The purchase of a multimillion-dollar system could qualify a **customer** for a greater **discount** on future purchases.)

7.1.4 Suppliers and Sales Channels

7.1.4.1   The test sponsor must disclose the pricing source for all items. Any vendor providing components that, in total, comprise 2% or more of the total system price after discounts have been applied must list the sales channel that a customer would use to obtain the price. If the sales channel requires the use of a separate pricing organization to obtain the price, that organization must also be disclosed.

Comment 1: The **sales channel** disclosed must be one that **any customer** would be reasonably expected to use. Sufficient information must be provided in the **FDR** to allow **any customer** to access the sales channel.

Comment 2: The disclosure requirement can be satisfied by providing a price quotation with a direct sales contact point, as is required for third-party providers (see Clause 7.1.4.4). The contact point must be from a sales channel that **any customer** would be reasonably expected to use.

7.1.4.2   Each supplier's items and prices, including **discounts**, must be listed separately. **Discounts** may not be dependent on purchases from any other suppliers.

7.1.4.3   All prices must be good at the time of publication. Price changes are subject to rules for revision as stated in Clause 8.2.

Comment: The intent of this clause is to allow price quotes that are not guaranteed through the availability date. However, the compliance of price can be challenged as long as the benchmark is listed as an active result.

7.1.4.4   In the event that any hardware, software, or maintenance is provided by a **third party**, the pricing must satisfy all requirements for **availability**, **discounts,** and full disclosure. Prices must be guaranteed by the **third party** in a written price quotation. The quotation must include the **part number** corresponding to the **line item**(s) in the pricing sheet, along with a price. The quotation must also include the name of the third party vendor and the contact information so **any customer** could also request a similar quote. This written quotation must be included in the Full Disclosure Report. This requirement may be satisfied with a copy of a publicly available price from a source such as a web-based tool or a hard-copy document. The test sponsor must ensure that all **Third Party** pricing complies with this specification. For pricing from a Third Party that has a total contribution of more than 2% of the price of the **Priced Configuration** after discounts, the Third Party must be either an OEM (original equipment manufacturer) or an approved reseller/distributor of the priced component(s). The test sponsor must still comply with price changes as described in Clause 8.2.

Comment: Since prices may not be based on any assumptions of prior or future purchases, any new result may

use an existing **Third Party** price quote provided that the components are applicable to the benchmark and the **Third Party** pricing rules are satisfied

7.1.5 Line Item Pricing

Pricing shown in the Full Disclosure Report must reflect **line item** pricing for hardware, software, and maintenance from the vendor's price books. If a component of the **Priced Configuration** is identified with a unique **part number** and not as a part of a package that is also uniquely identified by a **part number**, it should be shown with a **list price**, quantity and an extended price as a separate **line item**.

Comment1: The intent of this clause is that the pricing reflects the level of detail that an actual customer would see on an itemized billing.

Comment 2: In the case where the standard practice for a vendor is to price maintenance coverage as a single price covering a group of items, it is permissible to show this coverage as the maintenance price of the first item in the list.

7.1.6 National Considerations

For publishing in another country other than the country for which the results are originally published, it is permitted to substitute local components for those in the original report, providing the substituted products are sold to the same product description or specifications.

The pricing excludes domestic taxes and shipping charges that would be incurred in the country for which the results are published. It must include tariffs, custom duties/fees and shipping to a domestic port of entry if the component originates in another country.

Comment: The intent of this clause is to encourage local country pricing by allowing substitution of equipment for country specific reasons such as voltage, product numbering, industrial/safety, keyboard differences, etc., which do not affect performance.

7.2 Priced System

7.2.1 Priced Configuration

The **Priced Configuration** is defined in the benchmark specification. The price of the entire **Priced Configuration** must be used, including all hardware (purchase price), software (license charges) and hardware/software maintenance charges over a period of 3 years (36 months).
Pricing must be for a one time, stand-alone purchase. The price listed must be the full price a customer would pay for new equipment and new software licenses. There must be no assumptions of other purchases (past, present, or future), other customer locations with similar systems, or any other assumption that the customer has made or will make any other purchase from the vendor.

Comment 1: Some licensing agreements are based on the number of users for the system on which the software is running. The number of users for TPC benchmarks is defined by the benchmark specification, if applicable. Any usage pricing must be based on the pricing policy of the company supplying the priced component.

Comment 2: In cases where the number of emulated users is not defined by the benchmark specification, the pricing model cannot be based on a license that restricts the number of users.

7.2.2 Pricing of Supporting equipment

7.2.2.1   Components that may be needed for the benchmark test but are not included in the **Priced Configuration** are not priced. The price of the load generating system(s) (e.g. Remote Terminal Emulator or Remote Bowser Emulator or Driver) is not included in the total cost calculation. In the case where the system used to generate load provides functionality in addition to the emulation described in benchmark specification, then the price of those hardware/software components are to be included.

7.2.2.2   It is assumed that a customer would purchase the SUT to provide services in a datacenter or remote site. The cost of connecting their users to that data center is not considered as part of the priced system. Network switches, cables, leased lines, or other connectivity costs are assumed to be the same for any possible implementation and are considered separately by a customer. Network components that are required to interconnect components of a SUT are to be priced. The defining requirement is the nature of the traffic supported by components. If parts of the SUT have any communication amongst themselves (e.g. load balancing information, RPC traffic, etc.), then those communication components must be priced.

7.2.2.3   Communication or network multiplexers and demultiplexers are not considered as part of the priced system if they do not use the contents of the data to make decisions on how to multiplex. For example, a multiplexer can be used without being included in the priced system if it simply allows multiple communication connections for users to be collected and delivered to the SUT. A multiplexer that also did load balancing and used the contents of the data coming from the user connections to decide how to deliver the user connection would have to be included in the priced components of the SUT.

7.2.2.4   Standalone protocol converters (e.g. Ethernet to USB), modems, and other communication devices that are not used to interconnect parts of the SUT and do not draw resources (such as power, memory, or storage for startup) from the SUT are not considered as part of the **priced configuration**. If they do require SUT resources for startup or operation, they must be included in the priced components of the SUT.

7.2.3 Database Storage and Recovery Log Pricing

Storage and recovery log equipment, if required to be priced, must be included in the **Priced Configuration.**

7.3 Maintenance

7.3.1 Minimum Maintenance Requirements

Hardware (see clause 7.3.2) and software (see clause 7.3.3) maintenance must be figured at a standard pricing which provides 7 days/week, 24 hours/day coverage, either on-site, or if available as a standard offering, via a central support facility. Maximum hardware **maintenance response time** must not exceed 4 hours on any part whose replacement is necessary to correct a **Failure**. Software maintenance updates (see clause 7.3.4) must also be included in the pricing.

Comment 1: The intent of hardware maintenance pricing is not met by pricing based on the cost to fix specific failures, even if the failure rate is calculated from Mean Time Between Failure (MTBF). The maintenance pricing must be independent of actual failure rates over the 3-year period, no matter how many failures occur during that period.

Comment 2: Maintenance terms and conditions must be publicly available, or the terms and conditions must be provided to an auditor.

Comment 3: To be commercially reasonable, standard maintenance contracts are not offered in all possible locations in a large country. The requirement for 4-hour **Maintenance Response Time** is met if the maintenance contract covers all areas within two hours travel time of an international airport in the country where the system is being priced. It is not assumed to cover all physical locations in a country.

7.3.2 Hardware Maintenance Options

7.3.2.1   Central Support
If central support is claimed, then the appropriate connection device, such as an auto-dial modem, must be included in the hardware price. Also, any software required to run the connection to the central support, as well as any diagnostic software which the central support facility requires to be resident on the tested system, must not only be included in pricing, but must also be installed during the benchmark runs.

7.3.2.2   Customer Replaceable Units
It is acceptable to incorporate, for pricing purposes, the use of spare, customer replaceable hardware items under the following conditions:

1.   An additional 10% of the number of configured units of the replaceable items, with a minimum of 2, must be priced for spares.

2.   The vendor must include a support service that guarantees replenishment on-site within 7 days throughout the 3-year maintenance period and covers every unit of the replaceable items (i.e. configured units and spare units).

3.   The items must be **Generally Available** as spareable and must be replaceable for **any customer** installation.

4.   The designation of the items as spareable and replaceable cannot depend on a threshold of purchased quantity.

5.   The customer must be able to identify which part has failed within 4 hours of **Failure**.

6.   The method for identification and replacement of the replaceable items must have customer documentation that is sufficient to accomplish the actions for item 5 above, without additional consultation.

Comment: The use of spares is intended to assist in complying with the four-hour maximum hardware maintenance response requirement. The **Priced Configuration** must maintain the same quantities of components, including spares, for three years. This requirement necessitates maintenance for the spares to ensure replenishment. Shipping costs need not be included in the replenishment support.

7.3.3 Software Maintenance for Defects

Software maintenance provides support to resolve **defects** in the **Priced Configuration**'s software. The highest priority **defect** addressed by this support is a **defect** that prevents normal operation of the application. This does not include **defects** in the application code. For those high priority **defects**, software maintenance support must

provide the following within four hours:

1. Acknowledgment of the **defect** with an identifier that may be used for reference.

2. The start of a **defect** resolution process that requires some direct interaction with the customer.

3. A commitment to fix **defects**.

7.3.4 Software Maintenance Updates

Software maintenance updates include **fixes** and documentation for **defects** that have been identified, resolved, and incorporated into patches, maintenance releases, update releases, etc. These software maintenance updates must be made available to customers over the three-year period in a timely manner. The distribution of the software is flexible, but customers must receive either the software automatically or notification of the means by which to obtain the software. If the software maintenance is separately priced, the pricing must include at least three distributions of maintenance updates over the three years. The total cost of the software maintenance must include both the cost of distributing the software maintenance update, as well as the cost of the actual update itself. The supplier must make clear to the customer when and how to obtain the updates. The maintenance update may include additional features and existing feature enhancements, in addition to the traditional bug **fixes**.

7.3.4.1 The supplier must provide a defined mechanism for reporting **defects**. Acceptable mechanisms include personal interaction, telephone or other electronic means.

7.3.4.2 The reporting mechanism must be available 7 days a week, 24 hours a day.

7.3.4.3 A maintenance update must include all **defect fixes** that are qualified for general use and are not limited in scope. Included are **fixes** for problems found by other customers and by the product owner that are applicable to most or all installations of the software. This requirement precludes the use of a software maintenance contract that only provides **fixes** to bugs that are found by a specific customer.

7.3.4.4 A maintenance update must not require a level of knowledge, sophistication, or effort to apply beyond that needed to install and administer the software product.

7.3.4.5 The TPC only requires the supplier to resolve issues arising from software **defects**. It does not require service for operational problems, consultation or for errors in application code.

7.3.4.6 It is reasonable that a software product may be stable and mature enough that it would not require any bug **fixes;** however, it should not be assumed at any time during the maintenance period that there will not be any bug **fixes** available.

7.4 Required Reporting

7.4.1 Pricing Spreadsheet

7.4.1.1. The pricing spreadsheet details how the 3-year cost of ownership is computed. It contains the prices, **discounts**, warranty information, and maintenance costs for all the hardware and software components in the **Priced Configuration**. Price disclosure shall be presented in a structured fashion to enhance clarity and comparability between test results.

Comment 1: Discounts, warranty, and maintenance prices may apply to one or a group of **Line Item(s)** in the price spreadsheet. The spreadsheet must identify which **Line Items** are included in the group.

Comment 2: A representative pricing spreadsheet is included in each TPC Benchmark specification in the sample executive summaries.

7.4.1.2.   The pricing spreadsheet must be included in the executive summary and must include the following items for each component in the **Priced Configuration**:

1. Part name or brief description

2. **Part number** (see definitions)

3. Source of the component, whether from a benchmark sponsor or a third party (note: this can be an index into a list of component sources, provided that the list is included in the pricing spreadsheet) For all components that are not orderable at the time of the publication of the FDR, the source must be appended with an "*", pointing to the following footnote: "* These components are not immediately orderable. See the FDR for more information."

4. **List price** of the component (see definitions)

5. Quantity of the component used in the **Priced Configuration**

6. The extended price of the component, based on the **list price** of the component, the quantity included in the **Priced Configuration,** and any component-level discounting

7. Three-year maintenance price, or a notation that maintenance for the part is included in another maintenance charge.

7.4.1.3.   For each different server type used in the **Priced Configuration** (e.g. Database Server, Client, Image Server, Web Server, etc.) or server configuration (e.g., 4-way Database Server and 8-way Database Server in same benchmark), pricing subtotals for **components** and associated maintenance must be disclosed and grouped into the following categories:

1. General Hardware (e.g., processors, memory, controllers, packaged **components**, etc.);

2. Storage devices, including interconnect hardware (if applicable). Storage that is included in the base price of a system need not be split into a separate category.

3. Software licenses (if applicable). Software that is included in the purchase price of the **Priced Configuration** need not be split into a separate category.

The total purchase price of the **Priced Configuration** and its associated 3-year maintenance price must be included in the pricing spreadsheet, along with the price/performance metric.

7.4.1.4.   The percentage, amount, and basis (including type and justification) of all **discounts** listed must be disclosed (see Clause 8.1.2.2). A tabular summary may be employed to simplify the presentation.

Comment: Thresholds for **discounts** need not be disclosed.

7.4.1.5.   The following advisory notice must be reproduced at the bottom of the spreadsheet, using a sans serif font no smaller than 8pt:

"Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components.

7.4.2 Price Reporting

7.4.2.1. Two quantities will be reported with regard to pricing. The first is the total 3-year price as described in Clause 8.1.2.2. The second is the Price/Performance metric as defined in the TPC Benchmark specification.

7.4.2.2. The country where the **Priced Configuration** is priced must be disclosed. All components of the system must be **Generally** A**vailable** in the referenced country by the **Availability Date**. The currency used must be one that customers commonly use in that country and must be identified by the 3-letter currency code (see ISO 4217). It is sufficient to include the ISO code with the final price and price/performance metrics. The ISO codes for each currency can be obtained from the Internet or the TPC-Administrator. The total price metric must be represented in the basic ISO monetary unit. The price/performance metric may be represented in basic ISO monetary units or $1/100^{th}$ of the basic ISO monetary unit. If the price/performance metric is less than one monetary unit, it must be displayed with 2 significant digits. For example, in the United States, the system price must be reported in whole dollars and the price/performance may be reported in dollars and cents. Any fraction of a unit must be raised to the next highest unit (e. g., $12.123 must be shown as $12.13USD for price/performance and $13,456.23 must be shown as $13,457USD for the total system price).

Clause 8: FULL DISCLOSURE

8.1 Full Disclosure Report Requirements

This section includes a list of requirements for the Pricing-related items in the Full Disclosure report.

8.1.1 General Items

8.1.1.1   The order and titles of sections in the Test Sponsor's Full Disclosure report must correspond with the order and titles of sections from the benchmark specification. Reference material for **pricing** (such as price quotations) is to be included as the final appendix in the **FDR**. The intent is to make it as easy as possible for readers to compare and contrast material in different Full Disclosure reports.

8.1.1.2   The TPC Executive Summary must be included near the beginning of the Full Disclosure report. An example of the pricing page of the Executive Summary is presented in Appendix B.

   Comment: The Executive Summary must include all pricing sources and sales channels, as required in clause 7.1.4.

8.1.1.3   Diagrams of both measured and **Priced Configuration** must be provided, accompanied by a description of the differences.

8.1.1.4   Pricing must be reported in the currency of the country where the system is priced.

8.1.1.5   All primary metrics of the benchmark must appear on the **Pricing Spreadsheet**.

8.1.2 Clause 7 Pricing Related Items

8.1.2.1   A detailed list of hardware and software used in the **Priced Configuration** must be reported. The listing for each separately **orderable** item must have vendor **part number**, description and applicable release/revision level, price source, unit price, quantity, extended price, applicable discounted price and 3-year maintenance price. If package-pricing is used, the vendor **part number** of the package and a description uniquely identifying each of the **components** of the package must be disclosed to a sufficient level of detail to meet the requirements of 7.4.1.1.

8.1.2.2   The total 3-year price of the entire **Priced Configuration** must be reported, including: hardware, software, and maintenance charges.   The justification of any **discounts** applied must be disclosed in the price sheet. Sufficient detail of what items are being discounted and by how much they are being discounted must be provided so that the **discount** amount used in the computation of the total system cost can be independently reproduced.

   Comment 1: The purpose of this clause is to allow a reader to determine which components are discounted and the aggregate **discount** applied to them. **Line item discounts** are not necessary, but are sufficient. If only certain components are discounted, they must be identified.

   Comment 2: Given the price sheet, with the total system price, price/performance metric and **discount** monetary amounts removed, a reader should be able to compute the **discount** and total system price. The following examples satisfy this clause:

   1. "All hardware components from manufacturer A are discounted x% based on total dollar volume of those components in this configuration".
   2. "Single order amounts from Vender A above $y receive x% discounts."
   3. "An x% discount was based on the overall value of the specific components from vendor A in this single quotation. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the configuration."
   4. "All disk drives in this configuration are discounted by $z per disk, based on the number of disks purchased."

The following example does NOT satisfy this clause:
"A discount of $y is applied." The discounted components are not identified and there is not an indication of what criteria were used to generate the **discount**.

Comment 3: TPC disclosures are, by definition, showing **generally available** prices and **discounts**. The intent of this section is to provide sufficient information for **any customer** to obtain a quote for a price on a **line item**, group, package, or configuration that is similar to one used in a benchmark disclosure:

1. For **line item** prices/**discounts**, this rule applies to similar volumes of the item in the **FDR**.
2. For groups of **line items**, this rule applies to a similarly configured group in the **FDR**.
3. For revenue-based **discounts**, this rule applies to configurations of similar total price for the same classes/families as the **Priced Configuration** in the **FDR**.
4. "Similar" is assumed to be 0 - 10% larger than the portion of the **Priced Configuration** used in the **FDR**.

8.1.2.3 The committed **Availability Date** of **Components** used in the price calculations must be reported. The **Availability Date** must be reported on the first page of the Executive Summary and with a precision of one day. When the priced system includes products with different availability dates, the reported **Availability Date** for the priced system must be a date at which all **components** are committed to be **Generally Available**. Each **component** used in the **Priced Configuration** is considered to be **Available** on the **Availability Date** unless an earlier date is specified.

8.1.2.4 A statement of the benchmark performance metric, as well as the respective calculations for 3-year pricing, price/performance, and the availability date must be included.

8.1.2.5 Additional Clause 7 related items may be included in the Full Disclosure Report for each country-specific **Priced Configuration**. Country-specific pricing is subject to Clause 7.1.

8.1.2.6 For any usage pricing, the sponsor must disclose:
- Usage level at which the component was priced.
- A statement of the company policy allowing such pricing.

Comment: Usage pricing may include, but is not limited to, the operating system and database management software.

8.1.2.7 System pricing should include subtotals for components as described in Clause 7.4.1.3.

8.1.2.8 Each **line item** in the pricing sheet must indicate the pricing source for that item and indicate if it is not currently orderable. See example in Appendix B.

Comment: By standardizing the pricing spreadsheet and adding subtotals, the value of the **FDR** and executive summary will be enhanced. This will allow the reader to more easily compare results and determine pricing.

8.1.3 Clause 9 Audit Related Items

8.1.3.1   The auditor's attestation letter, which indicates the auditor's opinion of compliance, must be included in the Full Disclosure Report.

8.1.3.2   A review of the **pricing spreadsheet** is required to ensure that all required **components** are priced (see Clause 9.2.1). The auditor is required to review pricing calculations prior to issuing the attestation letter.

8.2 Revisions to the Full Disclosure Report

Any modification to pricing or components requires that the **pricing spreadsheet** and metrics be revised. Revisions to the full disclosure documentation shall be handled as follows:

8.2.1 Required Revisions

Revisions to the full disclosure documentation are required to be published under the following circumstances:

8.2.1.1   When cumulative price changes have resulted in an increase of 2% or more from the reported price/performance, the test sponsor must submit revised price/performance results to the TPC within 30 days of the effective date of the price change(s) to remain in compliance. The benchmark need not be re-run to remain compliant.

Comment: The intent of this clause is that published price/performance reflect actual current price/performance.

8.2.1.2   When the **Pricing Model** is changed in a revised **FDR**, it must be reviewed and approved by the auditor (see Clause 9.2.1.) The auditor's letter of attestation must be attached to the revised full disclosure report.

8.2.1.3   Changes to the price of an existing **component** of a **Priced Configuration** need not be audited. Other changes to the **components** of a **Priced Configuration** must be reviewed and approved by the auditor. The auditor's letter of attestation must be attached to the revised full disclosure report.

8.2.1.4   A change in the committed availability date for the priced system that is later than the published availability date must be published in a revised Full Disclosure Report. If the revised availability date is greater than 185 days after the initial publication of the Full Disclosure Report, the benchmark must be withdrawn.

8.2.1.5   If Hardware or Software product substitutions within the **Priced Configuration** are allowed in the benchmark specification, such substitutions require that the **pricing spreadsheet** and metrics be revised. Product substitutions must be reviewed and approved by the auditor. The auditor's letter of attestation must be attached to the revised full disclosure report.

8.2.1.6   A change in the committed orderability date for any components of the priced system that is later than the published orderability date must be published in a revised Full Disclosure Report. No orderability date may be later than the availability date for the **Result**.

8.2.2 Optional Revisions

8.2.2.1   Revisions to the full disclosure documentation are allowed to be published to reflect decreases in the price of one or more of the components of the **Priced Configuration**:

8.2.2.2   A change in the committed availability date for the priced system that is earlier than the published availability date may be published in a revised Full Disclosure Report. The availability date cannot be moved earlier than the submission date of the revised **FDR**.

Comment: The implication of 8.2.2.2 and 8.2.1.4 is that the availability date for the priced system may be changed to any date that is at least the date of the change and at most 185 days from the original **FDR** publication date.

8.3 Rules for Substitution of Components in a Priced Configuration

8.3.1 Intent of component substitution

The TPC recognizes the difficulties of conducting benchmarks that require large complex configurations. Sufficient quantities of components, which sponsors want to showcase in the FDR, may not be available. After the FDR is published, some component used in the original benchmark may become unavailable (e.g., end-of-life) or superseded by newer technology. As concessions to ease of benchmarking and business realities, the TPC allows component substitution only as set forth in this section of the pricing specification.

8.3.2 Identification of components that can be substituted

TPC benchmark specifications specify those components that can be substituted. When a benchmark specification does not specify that certain components can be substituted, they cannot be substituted.

8.3.3 Criteria for component substitution

8.3.3.1 Under no circumstance may a component substitution degrade benchmark performance. Proof may include but shall not be limited to documentation, published specifications, or a performance demonstration. In the case of measured proof for substitution, the response time and throughput performance characteristics must be equal to or better than the benchmarked components. In the case of non-measured proof for substitution, the capacity, response time and throughput performance characteristics must be equal to or better than the benchmarked configuration. Proof(s) of comparable performance must be cited in the FDR and auditor's attestation letter. Any substitution must comply with all other benchmark requirements.

8.3.3.2 Components must be substituted "one-for-one."

8.3.3.3 Substituted components must be clearly identified in the FDR.

8.3.3.4 Substitutions are not allowed on Results that have been withdrawn.

8.3.3.5 Any information and/or measurement results used to prove the validity of a component substitution must be included in the section of the FDR that describes the differences between the measured and Priced Configuration. Original and substituted components must be clearly identified. Line items that contain substitutions must be designated with an 'S' suffix in the Price Source column of the price sheet of the Executive Summary and a note in the Notes section of the price sheet saying "One or more components of the measured configuration have been substituted in the Priced Configuration. See the FDR for details."

8.3.4 When components can be substituted

Components can be substituted at initial publication of the FDR or whenever the FDR is revised.

8.3.5 Challenge of component substitution

The component substitution is open to challenge according to TPC policies.

8.4 Official Language

The official Full Disclosure Report must be written and submitted in English, but can be translated into additional languages.

Clause 9: AUDIT

9.1 General Rules

9.1.1 General

An independent audit of the benchmark results by an auditor certified by the TPC is required. An audit checklist for pricing-related items is provided as part of this specification. Other audit requirements are included in the individual benchmark specifications. Auditors may enhance this checklist. Please obtain the current audit checklist from one of the auditors. Please see the TPC Audit Policy for a detailed description of the auditor certification process.

9.1.2 Attestation Letter

The auditor's attestation letter must be made readily available to the public as part of the Full Disclosure Report, but a detailed report from the auditor is not required.

9.2 Auditor's Check List

9.2.1 Clause 7 Pricing Related Items

9.2.1.1   Verify that all required components of the **Priced Configuration** are priced.

9.2.1.2   Verify that the **pricing spreadsheet** includes all the hardware and software licenses, warranty coverage, and additional maintenance costs as required in this specification.

9.2.1.3   Verify that price quotes for any items from third party sources are available for inclusion in the **FDR**, as defined in Clause 7.1.4.4.

Comment 1: The **pricing spreadsheet** is a spreadsheet detailing how the 3-year cost of ownership is computed (see Clauses 7.1., 8.1.2.1, and 8.1.2.2). It must contain the prices, **discounts**, warranty information, and maintenance costs for all the hardware and software components in the **Priced Configuration**.

Comment 2: Since final pricing for new products is typically set very close to the product announcement date, the auditors are not required to verify the final pricing of the tested system prior to issuing the attestation letter.

9.2.1.4 Verify that the **Priced Configuration** has sufficient disk storage for system software, database tables, and recovery logs as required by the benchmark specification.

9.2.1.5 Verify that storage and processing elements that are not included in the **Priced Configuration** are physically removed or made inaccessible during the performance test.

9.2.1.6 Verify that additional components that are required by Clause 7.2.2.2 are included in the **Priced Configuration**.

9.2.1.7 Verify that all required maintenance is priced and that the terms and conditions of the priced maintenance satisfy this specification.

9.2.1.8 Verify that, when used, customer spareable components are priced in sufficient quantity to meet the requirements in Clause 7.3.

9.2.1.9 If components in the **Priced Configuration** are being supplied by a company other than the benchmark sponsor(s) (i.e., third party pricing), verify that valid price quotes have been received for all third party components and satisfy the requirement of Clause 7.1.4.4.

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Appendix A: Requirements for Benchmark Specifications

Each benchmark specification of the TPC shall have an abbreviated pricing clause that delineates benchmark-specific pricing items and points to the TPC Pricing Specification. References to the Pricing Specification should be made, as appropriate, in other sections of the benchmark specification, such as full disclosure and audit clauses.

The following lists identify what information is expected to be in the benchmark specification and what is in the pricing specification:

What is in Pricing Specification:

1. how things are priced

2. availability and procedures associated with obtaining price

3. how substitutions can be priced

4. maintenance/support properties and terms that must be included in the priced configuration

What is in Benchmark Specification:

1. what is priced

2. functional requirements of what is priced

3. what substitutions are allowed

The following text must be included in the benchmark specifications:

In Clause 7.0:

"Rules for pricing the **Priced Configuration** and associated software and maintenance are included in the current revision of the TPC Pricing Specification Version 1, located at www.tpc.org."

In Clause 8.0:

"Rules for reporting **Pricing** information are included in the current revision of the TPC Pricing Specification Version 1, located at www.tpc.org."

In Clause 9.0:

"Rules for auditing **Pricing** information are included in the current revision of the TPC Pricing Specification Version 1, located at www.tpc.org."

In addition, the benchmark specification is required to identify precise specifications for what components and functions must be included in the **Priced Configuration.** For example, in Clause 7, the following sections are required if it is the intent to include these components in the **Priced Configuration**:
"The following requirements are intended to supplement the Pricing Specification:
"7.1 On-line Storage Requirements

"7.1.1 **Continuous Operation Requirement**."

If it is to be included in the **Priced Configuration,** the benchmark specification must define what storage is needed to support the benchmark database, applications and any storage needed for continuous operation.
"7.1.2 **Archive Operation Requirement"**

"If there is a requirement for additional storage in the Priced Configuration, such as storage needed to contain the data that would be generated at the benchmark rate for a period of time defined in the benchmark specification, this requirement must be included in the benchmark specification.

"7.1.3 Back-up Storage Requirements"

If on-line back-up data is required by the benchmark, it must be included in the **Priced Configuration.**

"7.2 Other pricing requirements not included in the TPC Pricing Specification"

If there are additional pricing requirements, they should be included here.

In Clause 8, the benchmark specification must define the major categories that will be used on the **Price Spreadsheet**. For example, one benchmark may define a "Client" system, while another may define an "Application Server" system.

Appendix B: EXECUTIVE SUMMARY

The tables on the following page illustrate the format of the Pricing Sheet for the TPC Executive Summary and Full Disclosure Report. If all information will not fit on a single page with this format, the Pricing Sheet should be extended to a second page instead of reducing font size. The major headings (e.g. "Server Hardware" in this example) are defined by the individual benchmark specifications.

Really Good Computer Corporation [14 point font]	Widget Model RYO1234 [14 point font]	TPC Benchmark xx.y.z [@ aaaa, if applicable] [12 point font] TPC Pricing xx.y.z [12 point font]
		[Original] Report Date: 29-February-2004 [10 point font]
		Revision Date: 30-April-2004 [10 point font]
		Availability Date: 30-August-2004 [10 point font]

Description [10 point font sans serif bold (across this row and for main titles, below) 8 point font sans serif for other text in this section]	Part Number	Price Source	Unit Price	Qty	Extended Price	Discounted Price * [if line item discounts are used; else not needed]	3 yr. Maint. Price
Server Hardware							
RO90214,32MB,CDROM,NO HDD, MOUSE	201-A	1	15,995	1	15,995	15,995	3,839
RO90214 DUAL CPU UPGR CARD,1MB CACHE	25657	1	17,000	1	17,000	17,000	2,380
128MB SIMMS (4X32MB) FOR ECC MEM BD	82038	1 *	11,495	3	34,485	34,485	0
PCI LAN CONTROLLER/10	654	1	595	1	595	595	143
14'' EPA SVGA MONITOR	26019	1	480	1	480	480	116
101-KEYBOARD, PWR CORD	G6001A-A	1	85	1	85	85	0
DIFF PCI TO SCSI HOST BUS ADAPTER	1111	1	995	2	1,990	1,990	478
ECC MEMORY BOARD FOR PC TOWER SYSTEMS	77016	1	695	1	695	695	0
SCSI CABLE,68P HD –68P HD, 10FT	1EZ10	2	130	4	520	520	0
ED FIE, 256-PORT AUI	499578T256	1	7,000	5	35,000	35,000	0
LIGHTER 10 BASE-T XCVR AUI TO RJ45	40064	1	109	2	218	218	72
ED IEEE802.3 TRANCEIVER	4540-B	1	289	2	578	578	219
				Sub-total	107,641	107,641	7,247
Server Storage							
2GB 7200 RPM DISK MODULE	12009-HB	1	1,099	80	87,920	65,940	38,685
DESKSIDE CHASSIS	78900D	1	2,935	3	8,805	6,604	3,875
				Sub-total	96,725	72,544	42,560

Server Software

Description	Part #	Source	Price	Qty	Extended	Price	Discount
ACME UNIX	K985	1	9,800	1	9,800	9,800	0
ACME SERVICEPLUS FOR UNIX	K467	1	0	1	0	0	6,960
RDBMS & SQL (WITH 45% DISCOUNT)	123456789	3 *	58,000	1	58,000	58,000	46,400
TX MON: 8 USER	QQSQ123	4	12,000	1	12,000	12,000	0
TX MON: SERVICEPLUS	QQSQ432SA QV318ASC9X	4	0	1	0	0	3,000
TXMON: UPG TO UNLMTD USERS	N	4	23,000	1	23,000	23,000	0
			Sub-total		102,800	102,800	56,360

Client Hardware

Description	Part #	Source	Price	Qty	Extended	Price	Discount
RO90200,32MB,CDROM,NO HDD,MOUSE	200-A	1	12,995	1	12,995	12,995	4,622
128MB SIMMS (4X32MB) FOR ECC MEM BD	82038	1	11,495	2	22,990	22,990	0
PCI LAN CONTROLLER/10	7422	1	595	1	595	595	130
			Sub-total		36,580	36,580	4,752

Client Software

Description	Part #	Source	Price	Qty	Extended	Price	Discount
ACME UNIX	K980		2,250	1	2,250	2,250	0
ACME UNIX SERVICEPLUS: UNLMTD USRS	K466		0	1	0	0	24,000
ACME UNIX UPGRADE TO UNLMTD USR	P001ASA9FN		24,000	1	24,000	24,000	0
			Sub-total		26,250	26,250	24,000
			Other Discounts*			($7,584)	($2,566)
			Total		**$362,412**	**$338,230**	**$132,353**

Notes: [8 font sans serif bold]

* Basis for discounts: Server storage discounted 25% by dollar volume; All Acme-sourced products and services discounted by 3% for good-guy discount

Price Source: 1=Acme, 2=Allison Corp., 3=Lena RDBMS, 4=MonMon, Ltd.

* These components are not immediately orderable. See the FDR for more information

Audited by Benchmarks R' US

Three-Year Cost of Ownership: $470,584USD

Benchmark Rating: 4229.11

Price/Performance: $111.28USD

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. 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 components. For complete details, see the pricing sections of the TPC benchmark specifications. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

Appendix C: Example of Integrating Pricing Specification in Benchmark Specifications

The information contained in this appendix is intended as non-binding sample/example text that might be implemented in a benchmark specification, where it would then become binding.

(7.0) PRICING

Rules for pricing the **Priced Configuration** and associated software and maintenance are included in the latest level of the TPC Pricing Specification, located at www.tpc.org. The following requirements are intended to supplement the Pricing Specification:

(7.1) Priced Configuration

The system to be priced shall include the hardware and software components present in the System Under Test (SUT), a communication interface that can support user interface devices, additional operational components configured on the test system, and maintenance on all of the above.

(7.1.1) The driver is not required to be priced.

(7.1.2) System Under Test

(7.1.2.1) Calculation of the **Priced Configuration** consists of:

1. Price of the SUT as tested and defined in Clause X;

2. Price of a communication interface capable of supporting the required number of user interface devices defined in Clause X;

3. Price of on-line storage for the database as described in Clause X and storage for all software included in the priced configuration;

4. Price of additional products (software or hardware) required for customary operation, administration and maintenance of the SUT for a period of 3 years

5. Price of all products required to create, execute, administer, and maintain the executable query texts or necessary to create and populate the test database.

(7.1.2.2) Specifically excluded from the priced system calculation are:

1. End-user communication devices and related cables, connectors, and concentrators;

2. Equipment and tools used exclusively in the production of the full disclosure report;

3. Equipment and tools used exclusively for the execution of the DBGEN or QGEN (see Clause X) programs.

(7.1.3) User Interface Devices and Communications

(7.1.3.1) The priced system must include the hardware and software components of a communication interface capable of supporting a number of user interface devices (e.g., terminals, workstations, PCs, etc.) at least equal to 10 times the number of sessions used for the query test.

Comment: Test sponsors are encouraged to configure the SUT with a general-purpose communication interface capable of supporting a large number of user interface devices.

(7.1.3.2) Only the interface is to be priced. Not to be included in the priced system are the user interface devices themselves and the cables, connectors and concentrators used to connect the user interface devices to the SUT. For example, in a configuration that includes an Ethernet interface to communicate with PCs, the Ethernet card and supporting software must be priced, but not the Ethernet cables and the PCs.

Comment: Active components (e.g., workstations, PCs, concentrators, etc.) can only be excluded from the priced system under the assumption that their role is strictly limited to submitting executable query text and receiving output data and that they do not participate in the query execution. All query processing performed by the tested configuration is considered part of the performance test and can only be done by components that are included in the priced system.

(7.1.3.3) The communication interface used must be an industry standard interface, such as Ethernet, Token Ring, or RS232.

(7.1.3.4) The following diagram illustrates the boundary between what is priced (on the right) and what is not (on the left):

Figure 1: The Pricing Boundary
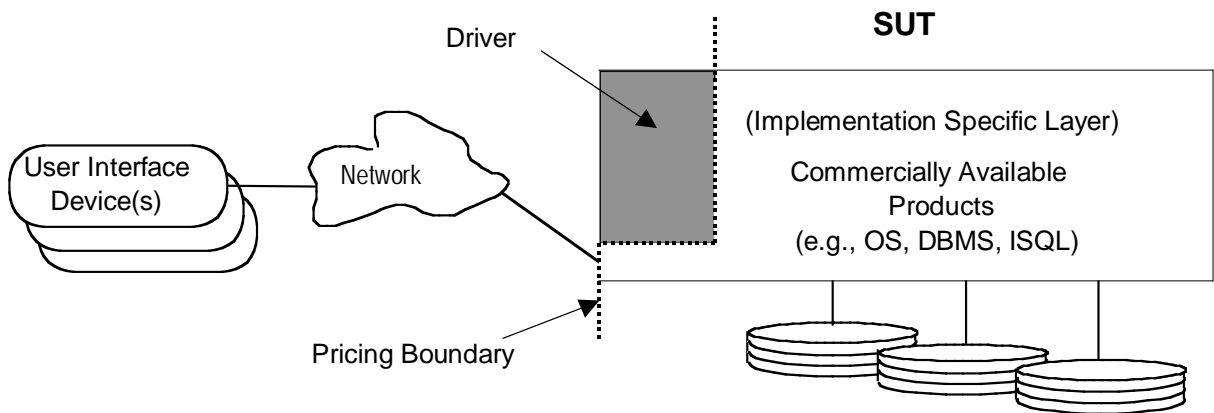
(7.1.4) Database Storage and Recovery Log

(7.1.4.1) Recovery data must be maintained for at least the duration of the run used to compute the published performance metric.(see Clause X).

Roll-back recovery data must be either in memory or in on-line storage at least until all transactions dependent on it are committed. Roll-forward recovery data may be stored on an off-line device provided that:

1. The process that stores the roll-forward data is active during the measurement interval;

2. The roll-forward data that is stored off-line during the measurement interval must be at least as great as the roll-forward recovery data that is generated during the period (i.e., the data may be first created in on-line storage and then moved to off-line storage, but the creation and the movement of the data must be in steady state);

3. All ACID properties must be retained.

Comment: Storage is considered on-line if any record can be accessed randomly and updated within 1 second even if this access time requires the creation of a logical access path not present in the tested database. For example, a disk-based sequential file might require the creation of an index to satisfy the access time requirement. On-line

storage may include magnetic disks, optical disks, or any combination of these, provided that the above mentioned access criteria are met.

(7.1.4.2)   While the benchmark requires the configuration of storage sufficient to hold the requisite recovery data as specified in Clause X, it does not explicitly require the demonstration of rollforward recovery except as required by the ACID tests (See Clause X).

(7.1.4.3)   The requirement to support at least eight hours of recovery log data can be met with storage on any durable media if all data required for recovery from failures listed in Clause 4 are on-line.

(7.1.4.4)   The storage that is required to be priced includes:

1. storage required to execute the benchmark;

2. storage to hold recovery data (see Clause 0);

3. storage and media needed to assure that the test database meets the ACID requirements defined in Clause 4

(7.1.4.5)   All storage required for the priced system must be present on the tested system.

(7.1.5) Additional Operational Components

(7.1.5.1)   Additional products that might be included on a customer installed configuration, such as operator consoles and magnetic tape drives, are also to be included in the priced system if explicitly required for the operation, administration, or maintenance, of the priced system.

(7.1.5.2)   Copies of the software, on appropriate media, and a software load device, if required for initial load or maintenance updates, must be included.

(7.1.5.3)   The price of an Uninterruptible Power Supply, if specifically contributing to a durability solution, must be included.

(7.1.5.4)   The price of all cables used to connect components of the system (except as noted in Clause 0) must be included.

(7.1.6) Component Substitution

Hardware or Software product substitutions within the SUT, with the exceptions noted below require the benchmark to be re-run with the new components in order to re-establish compliance. The exceptions are:

1. For any substitution of equipment emulated during the benchmark, (as allowed under Clause 6) a new test according to Clause 6.6.3.4 must be provided.

2. Secondary components such as front-end systems, disks, terminal servers, network adapters, routers, bridges, repeaters and the like may be substituted.

3. Substitution of the Server or Back-end system or the Host system, OS, DBMS or TP Monitor is not allowed under any circumstances.

Comment: The component substitution will be open to challenge for a 60-day period.

(8.0) FULL DISCLOSURE

(8.x.y) Pricing Related Items

Rules for reporting **Pricing** information are included in the current revision of the TPC Pricing Specification Version 1, located at www.tpc.org.

(8.x.y.1) **Price Spreadsheet** Categories: The major categories for division in the **Price Spreadsheet** will be:
Server Hardware
Server Storage
Server Software
Client Hardware
Client Storage
Client Software
Infrastructure (networking, UPS, consoles, other components that do fit into the above categories)