Chapter 5

Test Preparation
Phase II:
Test Design

The focus of Chapter 4 was on the planning and definition phase of PT while this chapter provides an in-depth view of the test design phase. All the necessary inputs for PT are captured under the test definition phase. These inputs are the building blocks for the design phase of PT.

Importance of Test Design Phase

The complete performance requirement document depicts the user’s expectations and underlines the need for such expectations. Using these expectations, testing the system directly without a proper design becomes a layman’s job, and the results from such an activity will lead to disaster. Therefore, the design phase is an important activity for PT. The first activity in the design phase is benchmark design (see *The benchmark handbook*, 2003), which is the backbone for designing the workload.

Benchmark Design

Real performance test runs depend on how accurately the testers simulate the production environment. To simulate such behavior of the Web site accurately, benchmarks are used. The benchmark is a standard representation of an application’s expected behavior.
or likely real world working conditions. Benchmark is a distillation of the essential attributes of a workload, which will be used for the test run. It is essential to know how the users are using the Web sites and what the users are doing for conducting a performance test. The behavior of the Web site varies with time, peak or normal, and hence the benchmarks also vary. This means there is no single metric possible. The benchmark should not be too general as it may not be useful in particular. The accuracy of the benchmark drives the effectiveness of the PT. Benchmark is domain specific. There is no point in comparing the benchmarks of one domain to another. To design benchmarks, one should have specific domain knowledge apart from knowing the application.

### What Are the Desirable Attributes of a Benchmark?

Any benchmark considered must be defined formally. A benchmark defined formally will have a set of attributes. These attributes, once collated properly, help the designer in understanding the benchmark. Table 5.0 provides the basic attributes of a good benchmark.

These attributes may vary from one to another benchmark. Those transactions which are considered for benchmarks must be relevant to the performance of the system.

### How to Design a Good Benchmark

To design a good benchmark, performance testers need to understand the behavior of the proposed system under different conditions. The conditions may be the load on the system at different times like peak, normal, and average. The benchmarks may be different at different times and need not be the same at all times. It is not sufficient to test just under average conditions but at different times. In any conditions, it is highly desirable to determine the duration in which the benchmark has to be developed. For instance, the peak time may span from 30 minutes to 2 hours. It does not mean one has to consider either 30 minutes or 2 hours duration to decide the kind of mix of transactions. It may be different at different time intervals. A good realistic mix of transactions determines the better benchmark. The mix of transactions may vary at different time intervals. Therefore, it is

<table>
<thead>
<tr>
<th>Attribute type</th>
<th>Description of the attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Must be meaningful within the target domain; it should be close to the real environment; otherwise the results will not be meaningful.</td>
</tr>
<tr>
<td>Understandable</td>
<td>Should be easy to understand.</td>
</tr>
<tr>
<td>Good metric(s)</td>
<td>Should be linear and orthogonal.</td>
</tr>
<tr>
<td>Scalable</td>
<td>Applicable to a broad spectrum of hardware/architecture.</td>
</tr>
<tr>
<td>Coverage</td>
<td>Does not oversimplify the typical environment.</td>
</tr>
<tr>
<td>Acceptance</td>
<td>Vendors and users must accept it.</td>
</tr>
<tr>
<td>Manageable</td>
<td>Possible to conduct the test.</td>
</tr>
</tbody>
</table>

Table 5.0. Basic attributes of a good benchmark
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