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## Performance Testing

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### Purpose:

The purpose of performance testing is to verify the system is able to meet the performance requirements, including number of transaction, on-line and batch processing, throughput and capacity. The emphasis is on verifying satisfaction of performance requirements and to ensure the system can handle stress and "worst case" scenarios.

### Assumptions/Pre-Conditions:

The test organization should have completed system testing successfully and all high priority errors should have been addressed. An updated version of the code should have been delivered to the Configuration Manager.

### Expectations:

- Some performance tests may be started as early as Unit Test, depending on the nature of the change, complexity and impacts of the change, and the level of risk. At the very least, this test phase should be executed to ensure no unexpected performance impacts exist.
- This test phase is applicable to both new system development and M&O. New development efforts should execute this test phase prior to Acceptance Testing. M&O projects should execute this test phase when:
  - A "large" number of changes have been made. "Large" is a relative term and is a judgment that must be made by the project team.
  - Critical hardware or software has been changed, such as the operating system
  - Periodically for growth monitoring purposes (not less than once a year)
- Tests should use a representative mix of different types of business cases, including normal, error and unlikely cases.
- Typical performance tests include:
  - System availability
  - Response time, for workflows, queries/retrievals, and key press (time between when a key is pressed and when the system responds with the requested action, query or display)
  - Throughput and capacity
  - Number of simultaneous users
  - On-line data entry
  - Batch processing periods and batch window compliance
  - Efficiency improvements for specific scenarios and overall
- Specifically prepared test data and use of automated testing tools can be very helpful.
- Ensure that any calculations for such things as response time, clearly identify the formula and method for measurement, particularly if several networks are involved. When analyzing performance requirements and results, be sure to account for differences in telecomm and network services. These may vary greatly and usually are components over which the project and prime contractor have no control.
- End-to-end tests and workflows should be performed to verify what the users will encounter and to determine how the system will behave for them. The information gathered should be used to properly shape end-user and management expectations during Acceptance Testing (e.g., if more memory is on order but not received yet).
- In some cases, performance requirements are measured over the life of the system/contract. In this case, measurements should be made and logged into a tracking tool for comparison to future

results at a later date.

### Responsibilities:

- Creation of Tests - Tester, Database and/or System Administrators
- Execution of Tests - Tester
- Approval of Test Results/Exit Decision -Test Manager, QA Manager, Configuration Manager, State Project Manager
- For a complete list of roles and responsibilities, refer to the [Responsibility Assignment Matrix \(RAM\)](#) (MS Word)

### Environment:

Performance Test Environment

### Type of Data:

Real data - data which was processed on the legacy system and is now being re-used for testing

### Exit Decisions:

- Refer to the [general test exit/acceptance criteria](#).
- Is the system able to support the current and projected workload?
- Is there a reasonable margin for peak processing and moderate growth?
- What is the current growth rate and peak processing profile?
- Does the system meet on-line and batch processing targets?
- **Checkpoint Decision:** Does the system meet the requirements and expectations for performance?
  - If not or the results are borderline, what can be done to address the problem?
  - How will the current performance level affect the users?
  - Should the project proceed if there are performance problems?

### References:

- IEEE Standard [829-1998](#), Standard for Software Test Documentation (link to pdf)

### Samples:

- [CWS/CMS Performance Test Exit Report](#) (MS Word)