pennsylvania
OFFICE OF ADMINISTRATION
INFORMATION TECHNOLOGY

# Information Technology Policy

## *Application Testing Tools Policy*

| ***ITP Number***<br>ITP-APP014 | ***Effective Date***<br>September 18, 2008 |
|---|---|
| ***Category***<br>Recommended Policy | ***Supersedes*** |
| ***Contact***<br>RA-itcentral@pa.gov | ***Scheduled Review***<br>April 2015 |

**This Information Technology Policy (ITP) establishes enterprise-wide standards and guidance for application testing tools.**

## 1. Purpose

The purpose of this Information Technology Policy (ITP) is to establish enterprise-wide standards and guidance for application testing tools.

## 2. Background

Application quality is fundamental to delivering expected business outcomes and agreed upon service level. The quality of testing is the overall contributor to the quality of the application. The effectiveness of the testing effort can be maximized by selection of a testing strategy which includes thorough unit, integration, system, regression, performance, stress testing, good management of the testing process, and the appropriate use of tools. This ITP identifies testing tools to assist the developer with all levels of testing.

Functional/unit testing is performed at the beginning of the software development life cycle. During this phase, bug fixing is the easiest, least time consuming, and therefore most economical. Integration testing is performed on a group of related modules which have already been unit tested. System testing is performed when all the modules are available.

These levels of testing relate to the functionality of the application, which ensures that the application produces the expected results.

Regression testing allows developers to ascertain if a change in one module impacts the overall functionality of the application. To be effective, performing this type of testing is to be easy and repeatable.

Performance/load- and/or stress-testing tools allow developers to measure the application's scalability, to benchmark the application's performance, and to identify bottlenecks under simulated normal, peak and extraordinary load conditions.

The results of effective application testing include improved product quality and reliability, decreased software maintenance time and costs, decreased outages due to software bugs and a reputation for reliable software.

The development of a common set of tools is expected to reduce development costs and ensure best-in-class applications which are extensible, easy to maintain and interoperable.

## 3. Scope

This Information Technology Policy (ITP) applies to all departments, boards, commissions and councils under the Governor's jurisdiction. Agencies not under the Governor's jurisdiction are strongly encouraged to follow this ITP.

## 4. Definitions

**Functional Testing**: Validating an application correctly performs functions identified in requirements documents. This includes testing for normal and erroneous input. Functional testing can be performed manually or automated.

**Load Testing**: Covers both performance testing and stress testing.

**Performance Testing**: Performance testing identifies bottlenecks during high volume simulation.

**Regression Testing**: Allows a consistent and repeatable validation of each new release of an application. This ensures no new defects have been introduced with the latest maintenance.

**Stress Testing**: Used to determine the load under which the application ceases to perform acceptably.

**Unit Testing**: Functional testing on each module in an application. Used early in development process before all components are completed.

**Integration Testing**: The phase of software testing in which individual software modules are combined and tested as a group. It follows unit testing and precedes system testing.

**System Testing**: Testing conducted on a complete integrated system to evaluate the system's compliance with its specified requirements.

## 5. Policy

New application development projects that require testing tools are to use the current application development tools as defined in section 6 of this ITP.

Major revisions to existing applications that are not using the current standards will be reviewed as part of the ITP-PRO001 - *Procurement Review Process* to determine if the investment warrants a change in standards at that time.

For application development projects using application development tools classified as "Retire," a date for migration off this technology has been established.

The use of testing tools is to align with the overall software development process as defined in ITP-APP012 – *Systems Development Lifecycle Policy*. The methodology promotes an iterative approach to testing with the goal of finding defects in the application development process as early as possible.

The use of testing tools is to be integrated with the requirements management strategy and the standards defined in ITP-APP017 - *Requirements Management Tools*. Test tools are to be used to validate that the application meets the functional requirements.

The use of testing tools is to be integrated with the change management strategy and the standards defined in ITP-APP019 - *Software Change Management Tools*. Testing tools are to be used to verify that changes in functionality were successfully implemented and that changes were implemented without impacting other application components.

All IT projects requiring testing tools are to be subject to review prior to inception for compliance with this standard through the Procurement Review Process (See ITP-PRO001).

## 6. Standards

**CURRENT STANDARDS**

(These technologies meet the requirements of the current architecture and are recommended for use.)

| Technology | Platforms | Technology Classification |
|---|---|---|
| IBM Rational Performance Tester | Windows | Current |
| IBM Rational Robot | Windows | Current |
| IBM Rational Functional Tester | Windows | Current |
| IBM Rational PurifyPlus | Windows | Current |
| IBM Rational Test Manager | Windows | Current |
| HP LoadRunner | All | Current |

| | | |
|---|---|---|
| HP/Quick Test Professional Version | Windows | Current |
| HP Quality Center | All | Current |
| Microsoft Team Foundation Server[1] | Windows | Current |

## CONTAIN

(These technologies no longer meet the requirements of the current architecture and are not recommended for use. They are to be phased out over time. No date has been set for their discontinuance.)

| Technology | Platforms | Technology Classification |
|---|---|---|
| Mercury WinRunner (all versions) | All | Contain |

## RETIRE

(These technologies are being phased out. Plans are to be developed for their replacement, especially if there is risk involved, such as lack of vendor support. A date for retirement has been set.)

| Technology | Platforms | Technology Classification |
|---|---|---|
| Compuware QARun (all versions) | All | Retire by 6/30/2006 |

## EMERGING / RESEARCH

(Emerging technologies have the potential to become current standards. At the present time, they are to be used only in pilot or test environments where they can be evaluated. Use of these technologies is restricted to a limited production mode, and requires approval of a waiver request. Research technologies are less widely accepted and time will determine if they will become a standard.)

| Technology | Platforms | Technology Classification |
|---|---|---|
| -- | -- | -- |

[1] Testing Tools capabilities of these products may be leveraged when the product is currently deployed for the products' primary use and when the products' capabilities meet the organizational needs for requirements management. (See ITP-APP013 *Integrated Development Environments)*

## 7. Related ITPs/Other References

- ITP-PRO001 – *IT Procurement Review Process*
- ITP-APP012 – *Systems Development Lifecycle Policy*
- ITP-APP013 – *Integrated Development Environments*
- ITP-APP017 - *Requirements Management Tools*
- ITP-APP019 - *Software Change Management Tools*

## 8. Authority

- Executive Order 2011-05, Enterprise Information Technology Governance

## 9. Publication Version Control

It is the user's responsibility to ensure they have the latest version of this publication. Questions regarding this publication are to be directed to RA-itcentral@pa.gov.

This chart contains a history of this publication's revisions:

| Version | Date | Purpose of Revision |
|---|---|---|
| Original | 9/18/2008 | Base Document |
| | 10/25/2010 | ITB Refresh |
| | 4/2/2014 | ITP Reformat; Merged STD-APP014A into ITP |