



Aspire Testing Update

October 25, 2006

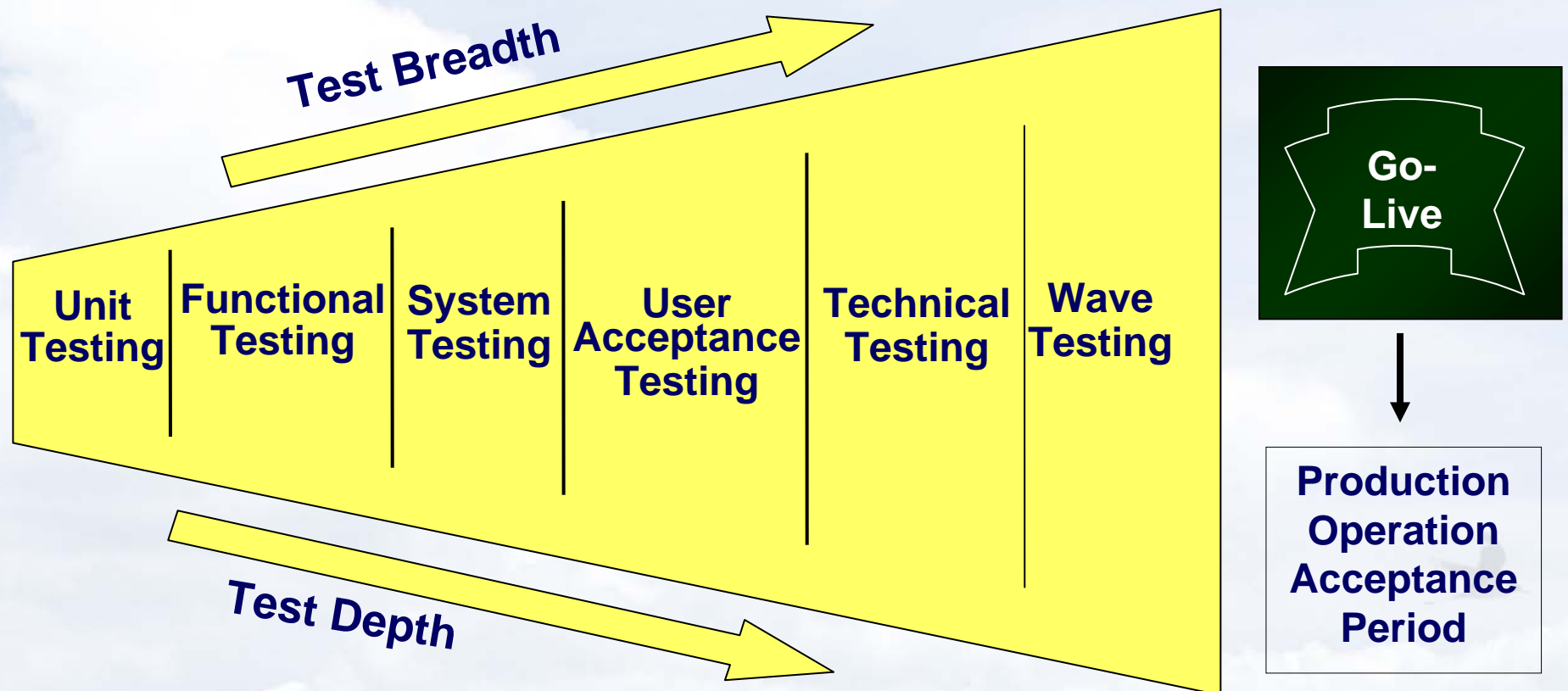


Agenda

- **Testing Phases – Overview**
- **Technical Testing - with special emphasis on:**
 - **Stress Testing**
 - **Performance Testing**



- Major Testing Phases for Aspire





Purpose

- To address technical testing requirements associated with the Aspire system.
- To validate the technical production and operational readiness.
- To facilitate the measurement of system performance.

Scope

- Define the technical test activities that will demonstrate the software is configured properly from a technical standpoint and the infrastructure and related support system resources are detailed to meet the demands of the Aspire system.



Types of Technical Testing

Technical Testing will consist of:

- Load
- Failover
- Thin Client
- Infrastructure
- Network Sensitivity
- Security
- Volume
- Backup and Recovery
- Operational Readiness
- Stress
- Performance



Batch Testing

- An additional type of testing that will ensure that the batch window is met and that resources are optimized.
- After each phase of go-live testing, the technical team will study the results to refine and continue to improve the batch process. This will be an ongoing process.



LOAD TESTS

- A major test, requiring substantial input from the Application Software Team on business processes.

FAILOVER TESTS

- Verify the success of redundancy mechanisms while under load for all applicable layers of the system.

THIN CLIENT APPLICATION TESTS

- Testing tools such as Quick Test-Pro are able to be used to drive a Thin Client so that response time can be measured from a user's perspective rather than from a protocol level.



INFRASTRUCTURE TESTS

Targeted Infrastructure Tests are isolated tests of each layer and or component in an end-to-end application configuration. The Infrastructure Testing phase will include the testing of:

- **Failover and cluster components of the PeopleSoft test and production architecture.**
- **Web servers - to verify the servers are adequately sized to handle incoming connections.**
- **Application servers - to verify that the second application server handles all the Project the Aspire traffic if the first application server is not available**
- **Database servers - to verify that if one database server is not available, the primary database on that server is started on the other database server.**
- **Test load balancing using successive logins to web servers and observe if round robin connection is established to web server and application servers.**



NETWORK SENSITIVITY TESTS

- Tests that set up scenarios of varying types of network activity (traffic, error rates...), related to Aspire transaction processes.
- Measure the impact of that traffic on various modules of the applications that are bandwidth dependant.



SECURITY TESTS

- Performed to prevent the unauthorized access and use of the system. Tests are performed in the following areas:
 - Network/Firewall, inclusive of Port scans from Intranet / Internet to verify only necessary Ports are open;
 - Database Application;
 - Application Software;
 - Operating System to verify lockdown from machine, services closed and patches up to date. Port scan from inside to identify and verify all open Ports.

- An independent security audit will be performed prior to go-live.



VOLUME TESTS

- Are often most appropriate to Messaging, Batch, Reporting and Conversion processing type situations;
- There is often no such measure as response time. Instead, there is usually a concept of Throughput, such as the volume of batch file transfers and with high reporting frequency.



BACKUP AND RECOVERY TESTS

- Should meet the following requirements:
 - Test for EMC (storage device) published recovery rates, which exceed the State's requested recovery rate of 250 GB/hour;
 - Test the data recovery with EMC Snap using database level tools such as redo logs and rollbacks, along with native Baseline Software components, such as effective dating, to attain 100% data recovery.



OPERATIONAL READINESS TESTS

- Verifies that all the application processes implemented are able to respond to user requests without having to wait for resources or information.
- Verifies that application, computing and network resources are ready in support of end user related operations and of the application processes.



STRESS TESTS

- Used to anticipate the limits of system capacity by determining at what load the system fails and how it fails.
- It is important to know in advance if a 'stress' situation will result in a serious system failure, or if everything just "goes really slow."
- There are varieties of Stress Tests, including spike, stepped, and gradual ramp-up tests.
- A spike test is where a single short burst of concurrent activity is applied to a system.
- Stepped and gradual ramp-up tests place loads on the system gradually or in steps until something breaks.



PERFORMANCE TESTS

- Determine end-to-end timing (benchmarking) of various time critical business processes and transactions while the system is under low load, but with a production sized database. This sets 'best possible' performance expectation under a given configuration of infrastructure.
- Highlight very early in the testing process if changes need to be made before load testing should be undertaken.



PERFORMANCE TESTS SETTINGS

- The Performance and Volume Test will use Mercury LoadRunner as the testing tool.
- Mercury LoadRunner provides comprehensive run-time settings to configure scripts that emulate the behavior of real users.
- It uses four major components to execute a test:
 - **LoadRunner Controller** – This is a control console which designs the scenarios, runs and stops the load test.
 - **VuGen** – This creates the scripts that imitate real users performing a business process on a client application.
 - **Load Generator** – This will simulate the required number of virtual users.
 - **Analysis** – This processes the gathered scenario result and generates reports and graphs.



Q&A