

IBM Software Group

P17 System Testing

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Module 3 : Unit Test

Rational software



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“The most exciting phrase to hear in science, the one that heralds the most discoveries, is not “Eureka!” but “That’s funny...”

Isaac Asimov, science and science-fiction author



Module Objectives

After completing this module, you will be able to:

- Define the General characteristics of unit testing
- The focus of unit testing activity
- Triggers for unit testing:
 - Simple path triggers
 - Complex path triggers



General Characteristics of Unit Testing

- Unit test verifies the functioning, in isolation, of software pieces that you can test separately.
- Scaffolding and a test or debug environment are necessary to get the code to execute.
- Code coverage tools can help verify that all paths have been executed.
- The more complex error paths are often overlooked, with expensive consequences later in the development cycle.



Unit Testing Activities

- The *execution* and *verification* of all statements and paths in the individual piece of code against the specifications and design documents for that code.
- Typically unit testing is performed on an individual component, often with scaffolding (test harness) to enable it to run.
- Unit testing includes analysis of the source code by validation tools that check for common defects and weaknesses in the code.
- Unit testing is normally highly automated and incorporated into the library submission or build processes.



Common Unit Testing Validation Checks

- Uninitialized variables
- Memory leaks
- Out of bounds processing
- Code complexity
- Conformance to coding standards
- Unreachable code
- Comment ratios



Unit Testing Triggers

Unit testing involves testing a specific unit of code even if the remaining function, component, or code is not available.

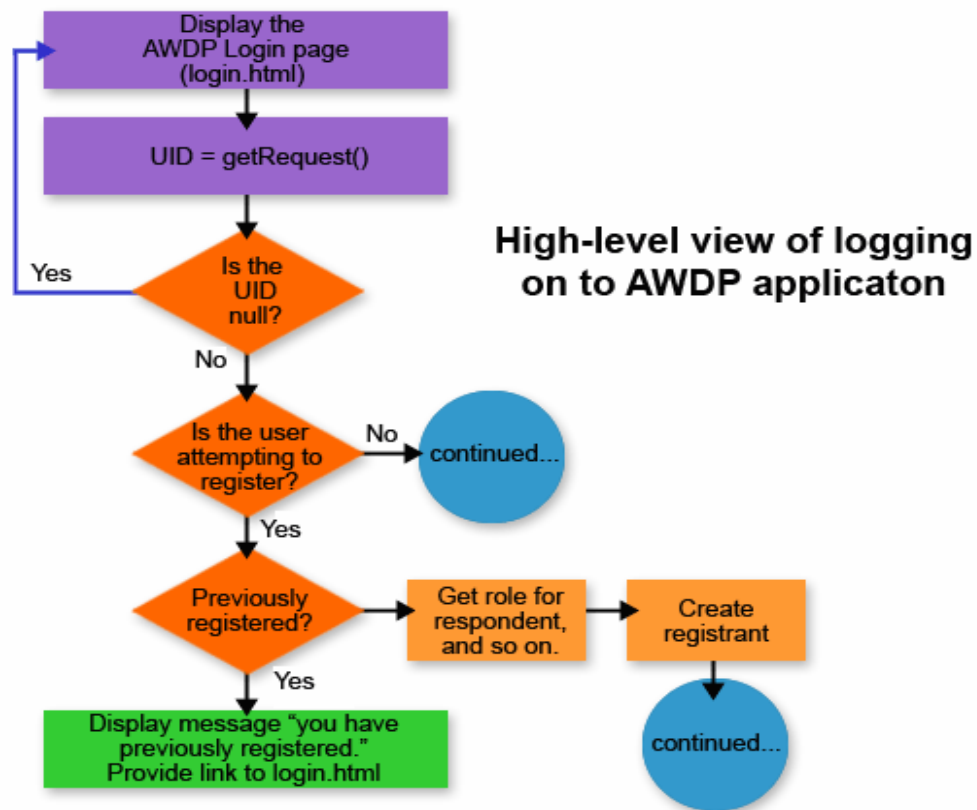
There are two types of unit test triggers:

- *Simple* path triggers
- *Complex* path triggers



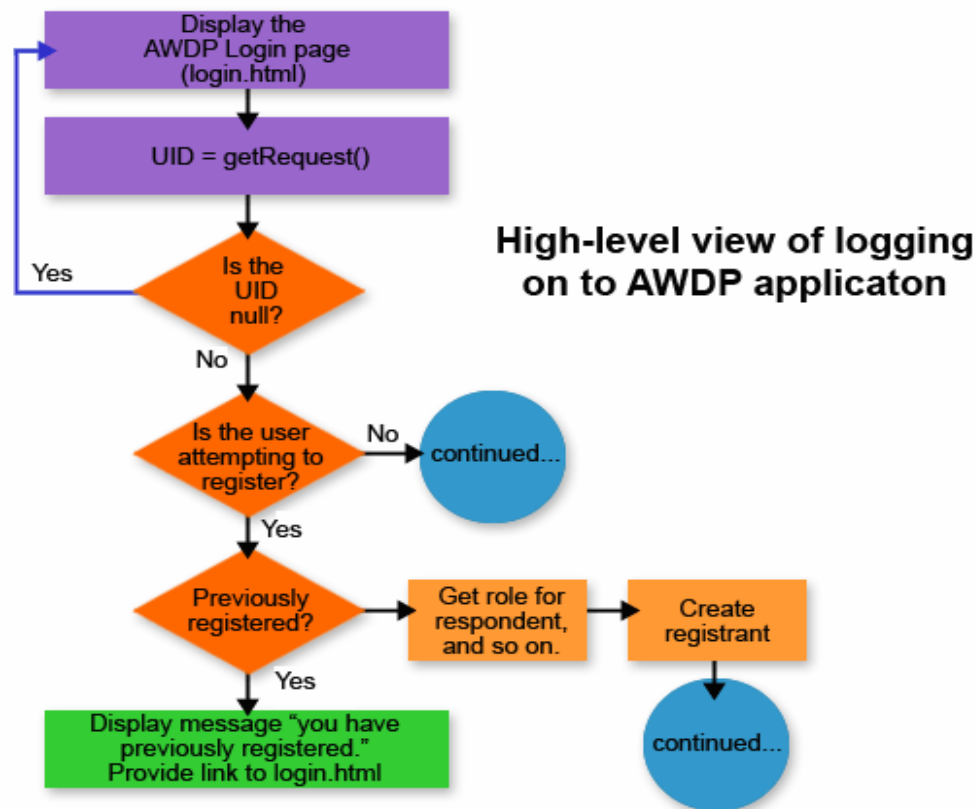
Simple Path Triggers

A simple path, or happy path, trigger is a straightforward attempt to verify that a single main code path is being taken.



Complex Path Triggers

A complex path trigger is when you attempt to execute several branches under several different conditions.



Complex Trigger

Set the UID to unregistered, but valid user ID



Module summary

- Unit test verifies that pieces of software that you can test separately or components function as expected, isolated from the rest of the software code that makes up the product.
- Unit test focuses on executing all code paths in the unit under test in order to ensure that individual components are coded correctly.
- Common issues covered by unit testing include compliance to coding standards, memory leaks, out of bounds processing, and uninitialized variables.
- Triggers for unit testing include simple path and complex path triggers.

