Selected Model problems

The table below shows the three model problems selected for discussion during the *Workshop on Architecture-Based Testing: Moving Research into Practice* held in Pisa on May 29-30, 2011 (see http://labsewiki.isti.cnr.it/projects/ast/ast2011pisa/). They have been selected from the full list of 29 *"model problems"* in architecture support for testing produced during the practitioners' *"Workshop in Architecture-Based Testing: Best Practices, Best Potential"* held at the SEI in Pittsburgh on February 1-2, 2011. The full list is available at http://labsewiki.isti.cnr.it/_media/projects/ast/ast2011pisa/ast_model_problems_ranked.pdf.

SCORE	Model problem scenario format
	• Source: Which stakeholder initiates the action? • Stimulus: What is the action? • Environment: What's going on at the time? What relevant conditions are in play? • Response: What is the desired outcome of the story? • Response measure: What quantitative measure tells us the activity was successful?

AST and Requirements

Scenario name	REQ1
Source	Tester
Stimulus	A tester chooses a test set to test the system for requirements satisfaction.
Environment	The architecture is complete. System test has not yet begun.
Response	The tester uses an architecture analysis tool that identifies the smallest number of tests to run to provide coverage of 98% of the requirements. Redundant tests are eliminated.
Response measure	Performing the analysis is much less costly and time-consuming to run than the tests it replaces.
Original notes from workshop	Can we use the architecture to tell us that (out of all of the huge number of tests possible) if we run a small number of tests, we will have covered 98% of the requirements?

AST and Product Lines

Scenario name	SPL1
Source	A stakeholder who wants a change to product B.
Stimulus	A change request, which will result in core assets being modified, is initiated for product B, which is a certified product.
Environment	The products in the product line must be certified to a specified standard. Core assets have been used as part of the product implementation. Several products have used these core assets. There is a policy that if any core asset changes, all products that depend on

		that core asset are rebuilt.
	Response	The changes to the core assets are made and the products, A and B, dependent on those assets, are rebuilt using approved tactics. An architecture-based analysis proves that no recertification of A, which only has new implementations of the same core assets, is needed. Evidence accumulated during the changes is used to expedite the recertification of B.
	Response measure	The effort to recertify B is significantly less than the effort to certify B originally while maintaining the level of confidence.

	Original notes from workshop	Testing Certified Product Line Assets : Can AST help to reduce certification costs for products by identifying and managing certifications levels of Core Assets?
		• Change Core or Variant Assets for next Product B without affecting certification of Product A
		  ○ Cost is an issue
		  ○ Risk to product delivery
		  ○ Takes too much time to perform testing for delivery
		• What does it take to certify a parent product having capability and then apply certification to other products?
		• Product A has completed the certification and a problem is found in a separate product. How can we prevent certification process if Product A needs to pick up change?
		• Does early or late binding help in reducing certification costs?

AST and Integration Testing

	Scenario name	INT16
	Source	Testers
	Stimulus	A tester wants to perform integration testing for a component into a running system
	Environment	The architecture of the runtime environment (system of systems) is complete and up to date. The operational system must continue to operate
	Response	The tester adds the component to the running system and performs necessary tests on it
	Response measure	Production instances of component respond to the tests without polluting live data with the test data from the component in question
	Original notes from workshop	• How can the architecture help us create an environment where new components are integrated in production/operation? • Data can be tagged as test, meaning that some, but not all actions are taken

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