Creating an Automated Software Testing Center of Excellence

Presenters:
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“AST: Practices that Yield Positive Results”

Agenda:

• About IDT
• Automated Testing Center of Excellence
• Demo
• Q&A
• Closing Notes
About IDT

• Information technology business headquartered in Arlington, Virginia
  
  *Our primary objective is to enable new software capabilities to be deployed with higher quality, faster and more affordably.*

• We provide:
  – Integrated automated testing solution – Automated Test and Re-test (ATRT) – also DOD approved
  – Automated testing strategies
  – Help improve your test program
  – ATRT Solutions Training
  – Other ATRT related services

• For more about IDT go to www.idtus.com
Automated Software Testing
Center of Excellence
Use Efficient Automated Testing Solutions
Automated Test Solutions

Handle systems of systems environment
Automated Test Solutions

• Handle systems of systems environments

ATRT's solution:

• ATRT can handle distributed and concurrent testing over a network: Automated tests can be executed concurrently over a network for the test case where various GUI- or message-based outputs are dependent on each other over a network or have to run in parallel.
ATRT Solutions (cont)

ATRT Product Suite

Test Dashboard
- Test Planning
- Dynamic Test Configuration
- Req. Coverage/Perf. Metrics
- Trend Analysis

Test Manager
- Test Conduct / Scenario Cntl.
- Message Gen. & Receive
- GUI Capture and Playback

Analysis Manager
- Event Reconstruction
- Requirements Verification
- Performance Analysis

Information Security Manager
- Security Gap Remediation
- Reporting/Metrics
- Performance Analysis

ATRT Solutions

Test Results
- Pass/Fail per Requirement
- Performance Reports
- Problem Trouble Reports

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Information Security Manager
- Security Gap Remediation
- Reporting/Metrics
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Developers and Testers
- Test Artifacts
- Test Scenarios
ATRT Solutions: Understanding your testing problem before choosing a tool

- Unit testing and code coverage
- Functional GUI testing
- Data Analysis
- Information Assurance
- Performance Testing
- Others, such as security testing, etc.

Test Manager
- Test Execution / Scenario Control
- Message Generation and Receive
- GUI Capture and Playback

Analysis Manager
- Event Reconstruction
- Requirements Verification
- Performance Analysis

Information Security Manager
- Network IA testing/patch management
ATRT Solutions: Keep it simple

- Testers often are subject matter experts but not necessarily software developers who could use an automated testing tool efficiently.
- Non-developers generally don’t want to be bothered with developing automated testing scripts; they want to be able to use the tool with the simple click of a button.
- Organizations don’t want their expensive developer staff spending time developing automated test cases when they can develop features.
- If tool is not usable it can become shelfware

Your Automated Testing Effort can’t become another Development Effort
ATRT Solutions: Scriptless Automation

ATRT's solution:

• Image based approach to developing automated testing.
  – Allows the testers to drag the action they want to take on a “canvas” to develop their automated tests in a test flow form
• No scripting is involved
OS and Platform independence: Since various VNC or RDP versions exist for most OSs, ATRT meets the “OS independent” requirement.

GUI technology independence: Via VNC and RDP we can interact with all GUI elements of the SUT as images, independent of the GUI technology used.

Handles display and non-display centric automation (ATRT currently supports different protocols such as TCP/IP, User Datagram Protocol [UDP], Common Object Request Broker Architecture [CORBA], DDS, SOAP over http.)
Automated Testing Center of Excellence

Implementing the Automated Test Program
Implementing the Automated Testing Program

There is never time
Implementing the Automated Test Program

- Start with a pilot that lends itself to automation
- Assess lessons learned
- Assess ROI
- Make “moving forward” decision
Automated Testing Center of Excellence

DEFINE AUTOMATED TESTING STRATEGY
Roles and Responsibilities

• Dedicated Resources
  – Don’t treat as side activity
  – Divide and conquer: Each person owns a feature’s automated tests (familiarization) and is responsible for maintaining across build releases
  – Section Lead responsible for Common Functions.
    • Leads are experienced capturers that enforce best practices

• Understand and communicate best practices specific to tool

• Unit Testing
  – Use unit testing tool such as junit or nunit
  – Executed nightly along with functional automated tests
AST TEST DESIGN
Strategic

- Not everything needs to be automated
- Reuse, reuse, reuse
- Assistive tool approach
- Detailed automation plan

Analyze procedures to determine best candidates for automation.
Strategic

- **Reuse, reuse, reuse**
- Not everything needs to be automated
- Assistive tool approach
- Detailed automation plan

Designing tests for maintenance is a large portion of any automation effort.
Strategic

- Reuse, reuse, reuse
- Not everything needs to be automated
- **Assistive tool approach**
- Detailed automation plan

If a procedure is not well-suited for automation as a whole, consider using ATRT-TM as an assistive tool for redundant / tedious sections.

(It’s not an “all or nothing” approach.)
Strategic

– Reuse, reuse, reuse
– Not everything needs to be automated
– Assistive tool approach
– Detailed automation plan

Separate problems of automation approach from challenges of learning tools such as ATRT TM.
Tactical

– Start and Stop States
– Keeping it modular
– Use Naming Conventions
  • `SUBSYSTEM_verb[Adjective]Noun` - optional values are in brackets

Use Source Control
Continuous Integration

CONTINUOUS AUTOMATED TESTING – INTEGRATED WITH DEVELOPMENT
Virtualized Environment
Systems of Systems Testing: GUI and message based automated testing combined

Use Virtual Environments
Continuous Integration Setup Example

Development/Integration/Test Cycle

1. Connect to Cloud VM's
2. Check in
3. nightly checkout
4. Build Server (Hudson)
5. Compile and package for deployment
6. Notification of completed build with changelog
7. Notification to start automated nightly test
8. Start Automated Tests and report results

Developers
- Connect to Cloud VM's using VNC
- Test VM's using VNC

Testers
- Connect to QA VM's using VNC

Development VM's

Version Control Server (Subversion)

Dedicated Automated Test VM's (ATRT)

CentOS Linux QA test VM's

Microsoft Windows XP QA test VM's

Cloud VM's for test and verification of deployed build
Automated Testing Center of Excellence

Contact us at edustin@idtus.com
Summary

- Scriptless, technology agnostic and easy of maintenance are important solutions to the automated testing challenge
- Our goal with ATRT is to provide solutions to these challenges
- Please go to our website http://idtus.com/products/atrt-test-manager/
  - For evaluation copies
  - Access to our customer portal (training videos, etc.)
  - For training requests
  - Other inquiries
- We do provide additional training
- Send email to edustin@idtus.com for other questions