Stop Chasing Errors ……Prevent Them by Performing Automated Unit Testing

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Automated Error Prevention
A New Approach to Improving Software Quality and Reliability

Costs of Faulty Software

Faulty software costs the US economy $60 billion annually

* National Institute of Standards and Technology, May 2002
State of the Software Industry

- Reliance on software is increasing
  - Hardware, consumer products, finance, healthcare, communications
- Errors can be devastating
  - Lost revenue, customer satisfaction, image, competitive edge
- Software development/testing processes are inadequate
  - Release errors, follow with bug fixes

Conventional Testing Practices

"Test Early and Often"

Beyond Testing: Industry Comparison

- Other industries have left testing curve to implement prevention
  - Automotive
  - Hardware
  - Electronics
- Two points in common
  - Process improvement to achieve prevention
  - Automation
Automated Error Prevention

Automated Error Prevention (AEP) advocates the deployment and automation of best practices that will prevent software errors, improving software quality and reliability.

5 SIMPLE AND PROVEN STEPS
ERROR PREVENTION

1) Detect an error
2) Isolate the cause of the error
3) Locate the point in the process that created the error
4) Implement practices to prevent the error from recurring
5) Monitor for improvements

Automated Error Prevention Value

• Refocuses teams from testing for and fixing bugs to improving the software lifecycle and delivering higher quality software
• Supports industry quality initiatives
  – CMM/CMMI
  – ISO 9001
  – Six Sigma
• Provides practical means for achieving quality
AEP Methodology™

Define a process to apply AEP to the software lifecycle. Describe how a methodology can be used in a group environment to improve processes.

AEP Solutions

- Products, Process, Best Practices
- Automate AEP practices
- Support critical group infrastructure
  - Monitoring
  - Intelligence
  - Data collection from third party tools
  - Analysis and Reporting

What does AEP Deliver…

- Stability of the code base
- Software Development Practices
- Design Review
- Coding Standards
- Testing
  - Structural Testing
  - Behavioral Testing
  - Functional Testing
  - Load Testing
  - Regression Testing
- Visibility
  - Process measurement
  - Performance measurement
How do I Implement AEP?

1. Define each of the roles that play a part in the process
2. Define procedures for how roles interact
3. Educate staff on expected behavior for each role
4. Automate practices to make them cost effective
5. Enforce practices
6. Measure, analyze, and report the effectiveness of the process
7. Use information to improve the process

Critical Infrastructure

- Automated solution on desktop and servers
  - Configurable as process changes
  - Integrated with existing user tools and IDE
  - Automatic enforcement of language standards
- Infrastructure
  - Shared requirements, information
  - Integration with other systems
  - Enforcement mechanisms
  - Reporting

Developers create or modify code, and use tools on their desktops to enforce requirements. Practices are enforce at source code check-in. Nightly build process verifies process and absence of violations. Team members receive reports relevant to their roles in the process. Architects use information to configure changes to the system and improve the process.
AEP Solutions

- Provide comprehensive process and quality visibility
- Aggregate key quality metrics across decentralized development
- Integrate with existing technologies and tools
- Automate key tasks for testing
- Automatically enforce critical coding guidelines
- Automatically capture and process system data

- Address key error prevention roles
- Integrate with existing technologies
- Automatically perform key tasks
- Automatically enforce requirements
- Automatically capture and process system data
- Provide comprehensive monitoring and reporting
Parasoft AEP Solutions

- Java
- C/C++
- .NET
- Web Application Development
- Web Services
- Databases