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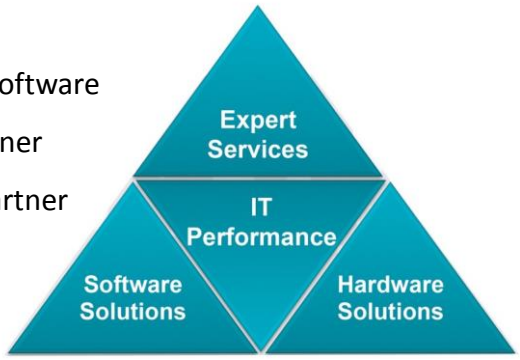
SHIFT LEFT TESTING what the heck does that mean?

About Us

- Incorporated in January, 2003
- QA and QC in expertise focused on functional, performance and application security validation
- HPE Software Gold Partner, HPE Authorized Software Support Partner & HPE Certified Training Partner
- Zephyr, Mobile Labs and Turnkey Solutions Partner
- QAI Training Partner



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Services

STAFF AUGMENTATION	• Long-term contract services, on-site and remote • QA leads, manual testers, automation experts etc.
CONSULTING	• Forensic audit, assessment, configuration, analysis etc. • Long-term and short-term, on-site and remote
OUTSOURCING	• U.S. based functional & performance testing • Software testing performed at our test lab by experts resources
TRAINING	• HPE Authorized Training Partner • On-site, virtual or public • Structured classroom format using HP materials
MENTORING	• Customized training essential to your team – in your environment • Cost-effective $$$

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Traditional Waterfall SDLC

- With the exception of Unit Testing, Testing is just prior to implementation
- Automated Testing relies on Business knowledge less than technical knowledge
- Defects are found later in the SDLC resulting in higher cost to fix
- Unit testing is normally the only testing implemented by Developers
- Defect have a greater impact on delivery if found later in the SDLC which is even a greater cost if found in production

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Traditional Test Automation

- Long release cycles
- Well defined Testing windows
- Feature packed releases of the entire application

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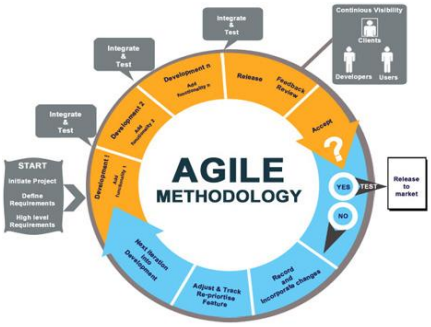
Enter Agile

Biggest impacts

- Short Release Cycles
- Testing integral to development



- Less formal
- Defects found sooner
- Iterative process
- Code is small enough to stand alone
- Increased customer feedback

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Enter Shift Left Testing

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Benefits of Shift Left Testing

- Detects & prevents defects early in SDLC
- Shorter time to market
- Lowers risks and costs
- Can use combination of methodologies and frameworks
- Encompasses elements of QA into single approach delivered in stages. Elements such as:
  - Static and dynamic testing
  - Automation
  - Dashboards
  - Continuous integration
  - Etc.

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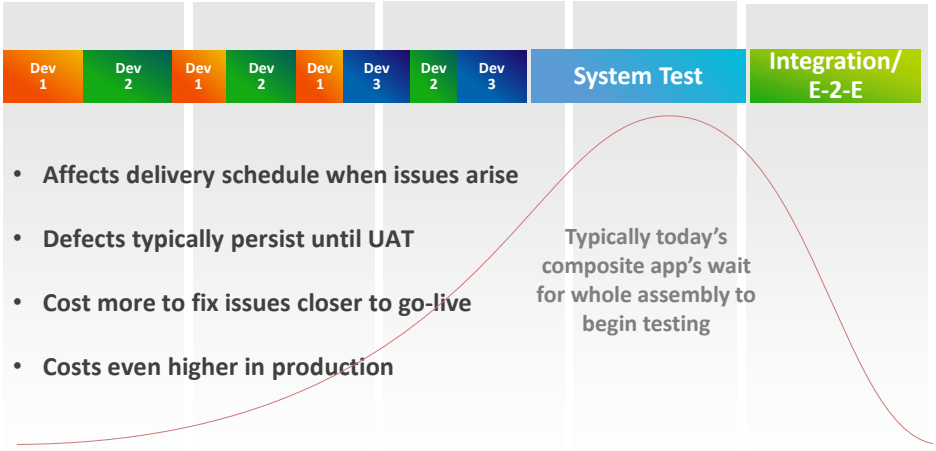
SDLC – Traditional testing model



- Affects delivery schedule when issues arise
- Defects typically persist until UAT
- Cost more to fix issues closer to go-live
- Costs even higher in production

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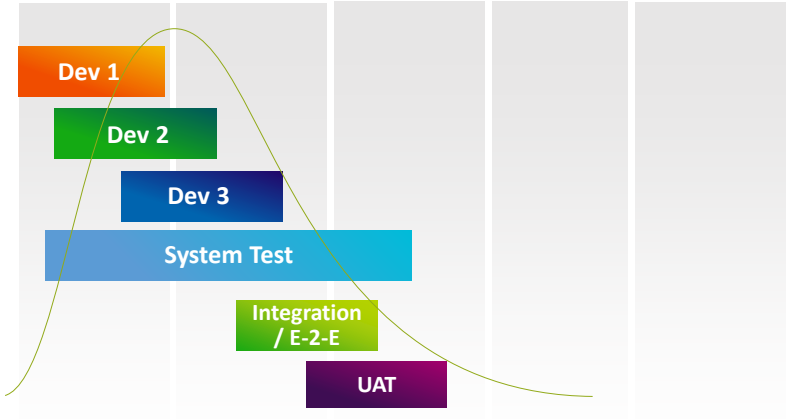
What is Shift Left?

Shift left is when you take your testing assets and processes and start testing early in the Software Development Lifecycle



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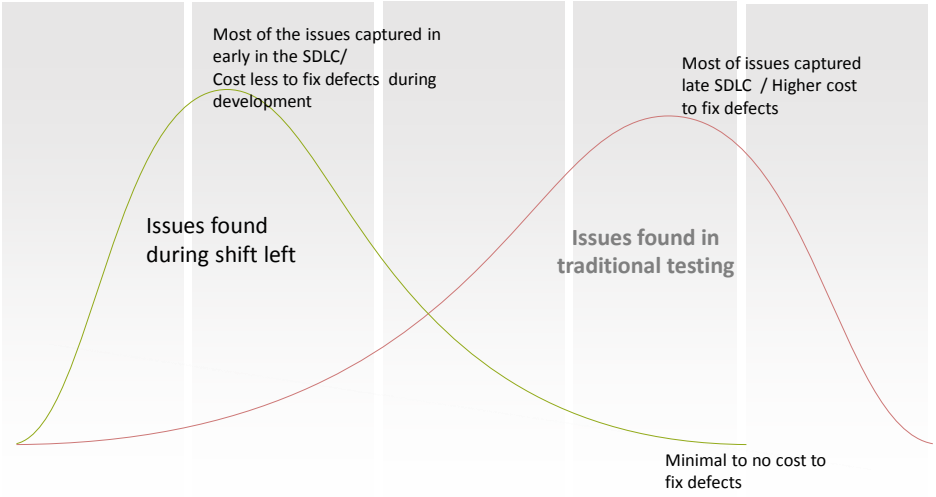
Comparison



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Shift Left Testing is not…

…a special *type* of testing. It is more about *when* the testing is done, and it is done earlier in the lifecycle.

Not a HOW but a WHEN!

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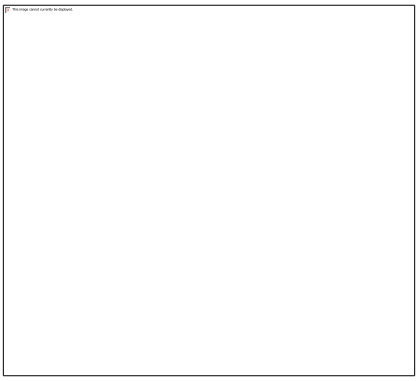
Value of Testing early

- Accelerated delivery schedule
- Reduced constraints
- Higher quality
- Defects found earlier in development
- Reduced complexity in overall testing



** Automation increases the return rate on all the above points **

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Shift Left Testing Approaches

Test Driven Development

- Is a process for when you write and run your tests along with writing the code. You run the tests until your code passes.

Behavior Driven Development

- BDD is a set of best practices for writing tests as user stories. BDD suggests to user stories behaviors, so instead of thinking of how the code is implemented, we spend a moment thinking of what the scenario is.

Service Oriented Architecture Testing

- Testing at the service layer

Unit Testing

- Creating test at the modular code level

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Another thought on Shift Left Testing…

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Applications Have Evolved…

Applications designed for traditional automation have evolved and new testing applications have been developed specifically to take advantage of the “Shift Left”

Testing Tools

- HP LeanFt
- Jira
- HP UFT
- Selenium
- Appium
- Cucumber
- Watir

Automation/CI Servers

- Hudson
- Jenkins

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Now that I know what it is, what next?

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What is needed for Shift Left

- Tools
- Environments
- Skilled Resources
- Training
- Alignment from Teams

Solution Bake-Off

Tool descriptions and how they compare:

JIRA

- JIRA Software is an agile delivery management solution providing teams the tools to create & estimate stories, build a sprint backlog, identify team commitments & velocity, visualize team activity, and report on your team's progress.
- How to use it in Shift Left Testing:
  - JIRA's integration with tools like Jenkins and GitHub allows for better tracking of builds and test results for those same builds
  - A wide array of add-ins and tools for JIRA allows the flexibility for delivery teams to address issues sooner
    - JIRA Service Desk connects operations tickets with development allowing for dev-ops integration
    - Bamboo allows users to monitor build status from inside the JIRA tool

VS.

- JIRA
  - Reporting: Agile, real time reporting for items like Burn Down
  - Tracking and Planning: create user stories and backlog
    - Scrum and Kanban boards
  - Integration with Jenkins and other deployment testing tools provides multifaceted Agile testing including shift left approaches
  - With Bitbucket set up deployment pipelines
  - Robust defect tracking ties to all other assets (e.g. user stories)
  - Does not fit in Waterfall organizations

- Octane
  - Reporting: Customizable real time reporting for items such as Burn Down
  - Tracking and Planning: Create user stories and backlog
    - Scrum and Kanban boards
  - Integration with Jenkins and other deployment testing tools
  - Native deployment pipeline module with Jenkins
  - Robust defect tracking ties to all other assets (e.g. user stories)
  - Can use in Waterfall organizations if desired

Selenium

Point	**Selenium 2 (Webdriver)–** Automated Functional Testing
Market Positioning	Browser based test automation Developers engaged in QA process, esp. agile projects Testing service providers Open Source Software
Highlights	Supports multiple browsers, OS, programming languages, Record/Playback
Why is it a threat?	• CIO's have been looking to reduce cost – embrace OSS, cloud .. • Developer influence is growing • Integrates in the IDE, can be invoked from other tools • More and more applications are web browser based now • Large community of users • Allows multiple parallel executions – more efficient

Selenium Weaknesses

- No Graphical presentation of test scripts
- Very basic checkpoints compared to UFT
- Basic reporting, no visual capture – inadequate for environments that need audit trail of test
- Exception handing has to be coded in – UFT can be configured for 'Recovery Scenarios'

vs. Selenium

- Lean FT allows users to create tests in Java and C#
- UFT and LeanFT can automated against platforms as diverse as SAP, Siebel, Terminal Emulation, Web and more
  - Supports IE, Chrome, Firefox and Safari
- Offers record and playback
- Extensible
- Scripts are presented in graphical or scripted formats
- Robust and configurable reporting
- Can add "movies", screenshots and other visual assets for audits
- Recovery manager can handle unexpected exceptions

- Selenium allows users to create tests in Java, C#, Python, Ruby and many other languages
- Selenium automates against the web platform
  - Browsers as diverse as Opera, Safari, IE, Chrome and more
- Offers record and playback
- Extensible
- No Graphical presentation of test scripts
- Very basic checkpoints compared to UFT
- Basic reporting, no visual capture – inadequate for environments that need audit trail of test
- Exceptions have to be "expected" and handling has to be coded

IBM

Point	**IBM RFT–** Rational Functional Test
Market Positioning	Lower the cost of functional testing Build a bridge to automation Reduce rework, minimize the re-recording of scripts, and reduce script maintenance
Highlights	Test Automation + Test Management
Why is it a threat?	• "Cheaper" and hence customers choose them over us • Generating VBScripts and Java scripts, while HP UFT can generate only VB Scripts • Users feel that execution of test script is quite good in RFT compared to HP UFT • Free 90 day trial available

RFT Weaknesses

- Code-centric and hence increasing time to productivity
- Does not support Descriptive Programming approach while UFT supports it
- Users need good experience of programming to achieve the objective
- Output values are manually fed using the data pool feature of RFT
- Object identification is quite good for standard objects. However identification of custom objects is tricky

Jenkins

- Jenkins is a cross-platform, continuous integration (CI) and continuous delivery (CD) application. It allows users to continuously deliver software by providing robust functions to define your build pipelines and by integrating with a large number of testing and deployment technologies.
- How to use it in Shift Left Testing:
  - Use Jenkins to build and test your software projects sooner and more often making it easier for developers to integrate changes to the project, and making it easier for users to obtain a fresh build.
  - By integrating with tools such as HPE Octane and JIRA, Jenkins enables testing as part of the build process and allows for robust tracking of associated test assets such as User Stories or Defects

Tool Integration

- JIRA and Octane integrate with Jenkins via a REST API or via native functionality allowing for tracking of build issues in those tools
- Jenkins as part of build testing can call, Selenium, UFT and LeanFt tests then push those results to Jira or Octane
- There are third party tools such as Tasktop that integrate many different tools
- The integrations between tools is diverse and in many cases employs a REST API interface for transferring assets between the different solutions

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Approach to implement Shift Left

- Acquire the appropriate tools for each strategy
- Identify critical areas or applications to implement
- Shift left principles need to become a core part of culture
- Consider a QA assessment
- Implement Quick Wins
- Identify Challenges

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Consider a QA Assessment

- Identify:
  - Current assets
    - Environment
    - Methodology
    - Team
  - LOE
  - ROI
  - Cost/Benefit

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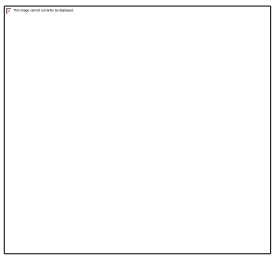
Suggested Shift Left "Quick Start" Activities

- Requirements Risk Analysis
- Static Testing
  - Peer reviews
  - Walkthroughs
  - Code inspection
- Structured and Standardized *Unit* Testing



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Challenges to Adapt Shift Left

- It's a culture shift!
  - Initially, not everyone will buy into shift left
- Initial software investment
- Building the team (i.e. skills, structure)
- Requires a team mentality
- Requires commitment from leadership
- Requires top level sponsorship

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Questions?

THANK YOU!

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