



INTERWOVEN®

Leveraging Traditional Software Validation Methods in an Agile World

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Quest 2009

Agenda

- **Brief overview of Interwoven**
- **Role of QA @ Interwoven**
- **Test execution challenges in an agile world**
- **Solving these challenges with:**
 - **Test case automation**
 - **Virtualization**

About Interwoven

- **Global leader in content management solutions**
- **Interwoven Products**
 - Web content management
 - Document & e-mail management solution for the legal and financial industries
- **Major Development locations**
 - San Jose, CA
 - Chicago, IL
 - Bangalore, India
- **Interwoven Customers**
 - 9 of BusinessWeek 's top 10 global brands
 - 27 of the 30 Dow Jones Industrials
 - 67 of the Forbes Global 100
 - 75% of Global Top 100 law firms
 - 73% of AmLaw 100 law firms
 - 67% UK law firms

About Interwoven Chicago

- **Enterprise document & e-mail management products**
 - Used by legal and financial industries
 - Desktop solution highly integrated with Microsoft Office products
 - Web solution standalone or integrates with Microsoft's Sharepoint
 - "Google on steroids" search product
- **Globally diverse engineering team**
 - ~50% Chicago, IL
 - ~50% Bangalore, India
- **Functional decomposition**
 - 20% QA Team
 - 70% Team OffShore
 - US Team: Product experts
 - 5% Documentation/Localization

Role of Quality Assurance @ Interwoven

- **Plays the role of the customer (end user)**
 - Looks at the application from an end user perspective
 - Users do not care whether an application is FORTRAN or JAVA/.Net
 - Users care whether the functionality delivered by the application meets their “needs”
- **Independent “eyes” and “ears”**
 - Determines whether the product is ready for “prime time”
 - Provides objective data to make informed project decisions
- **Quality Assurance is more than testing**
 - Testing is one method to ensure that “stated” functionality is being delivered
 - Requirement and design reviews and code inspections are other methods used to verify product quality
- **Project quality is everyone’s job**
 - Can’t test in quality
 - Developers are expected to unit test their applications

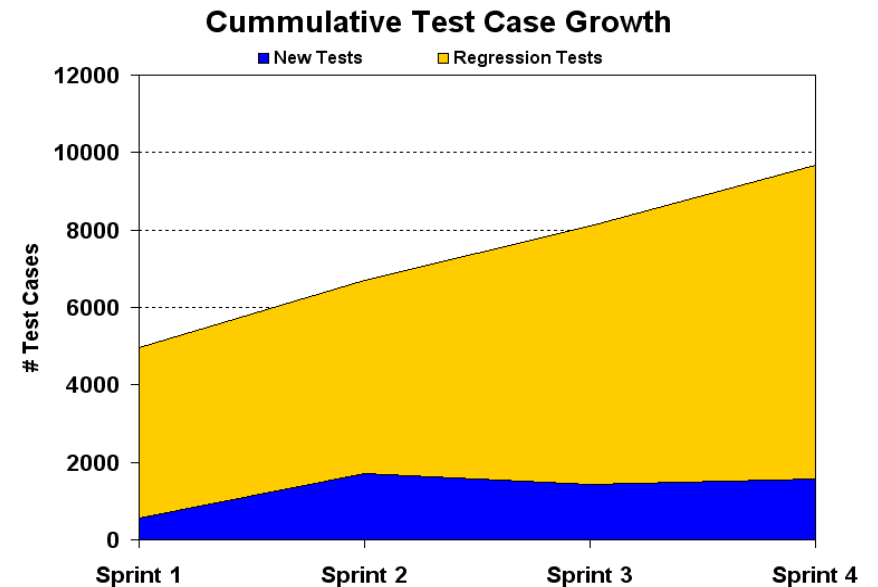
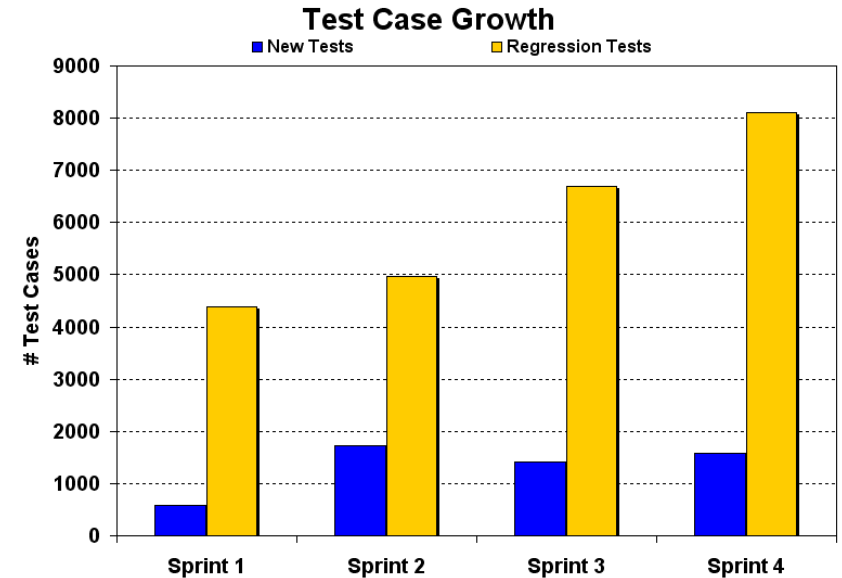
Test Case Execution Challenges in an Agile World

- **“Need for Speed”**
 - Small short development iterations means short test execution cycles
- **Constantly expanding test suite**
 - Test cases executed in prior iterations become regression suite
 - Not to mention existing regression test suite
- **Must be repeatable**
 - Executing the same use cases (test steps) with the same test data
 - Requirement for regression testing
 - *Sidebar: Repeatability is a pillar of quality*

Cannot Achieve Project Milestones using a Manual Testing Approach!

Ever Expanding Test Suite

- Test cases from sprint n-1 incorporated into the next regression test cycle
- Every month the amount of tests to executed increases by 18%
- Within 5 sprints, test case execution effort doubles!
- Need an effective method of executing the ever growing test suite



**Independent of the agile method used,
test case automation and test
environment virtualization is critical to
the success of the QA team and
ultimately the project team**

Most automation testing initiatives fail!

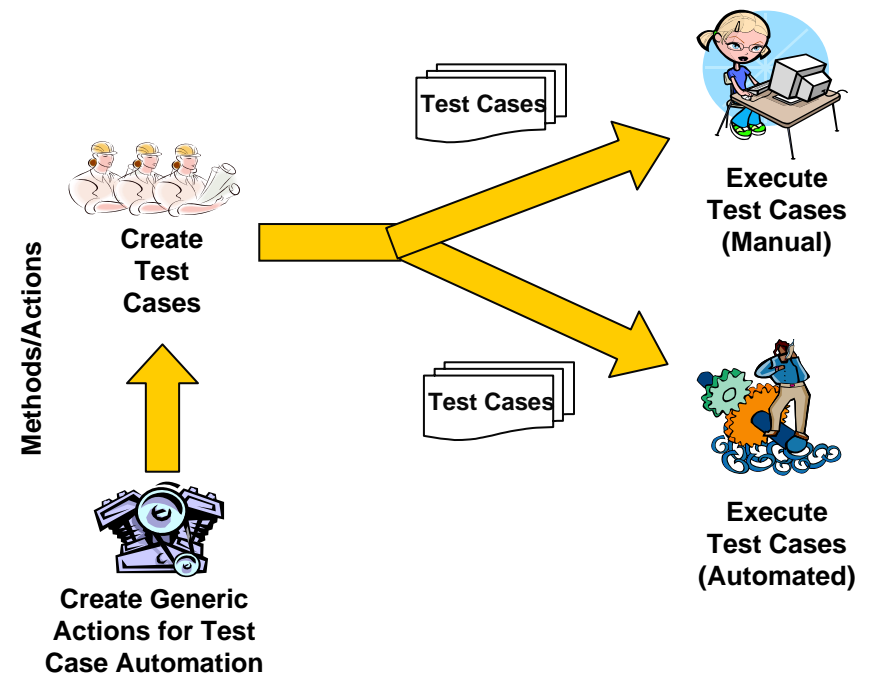
- **Why (Industry View)?**
 - **No plan or framework in place to effectively use automation tool**
 - What type of framework to use
 - Which applications to automate
 - How are automated test scripts are maintained
 - **Lack of detailed test cases**
 - Need Subject Matter Experts (SMEs) to automate test cases
 - SME were not automation tool experts
 - **Unplanned resource demand for test script maintenance**
 - **All or nothing approach use**
- **Companies successful at automation programs either:**
 - Never completely realize benefits (cost and cycle time reduction) from test automation
 - Require several attempts to implement the right automation strategy

Automation Goals & Objectives @ Interwoven

- **Low tool knowledge required to be successful at automating**
- **Easy to automate test cases**
- **Minimize redundant work**
- **Able to create automated test cases prior to application availability**
- **Automation approach must be portable among applications**
- **Low entry cost and more importantly low maintenance cost for:**
 - **Test Scripts**
 - **Test Automation tool**

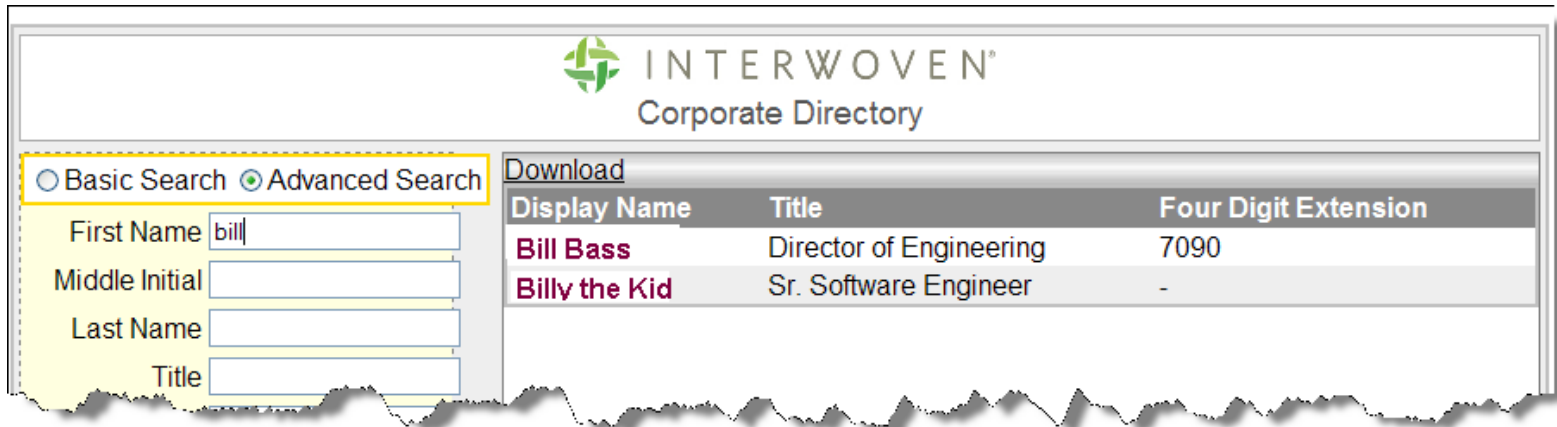
Automation @ Interwoven

- Test cases are the automated test scripts
- Benefits:
 - Not tied to a specific automation tool
 - Focuses team on writing test cases which reduces the cost and time of test case design and execution
 - Non-technical testers and business analysts can develop executable test automation
 - Test cases (automation scripts) created from wireframes



Sample Automated Test Case @ Interwoven

- Application:



INTERWOVEN®
Corporate Directory

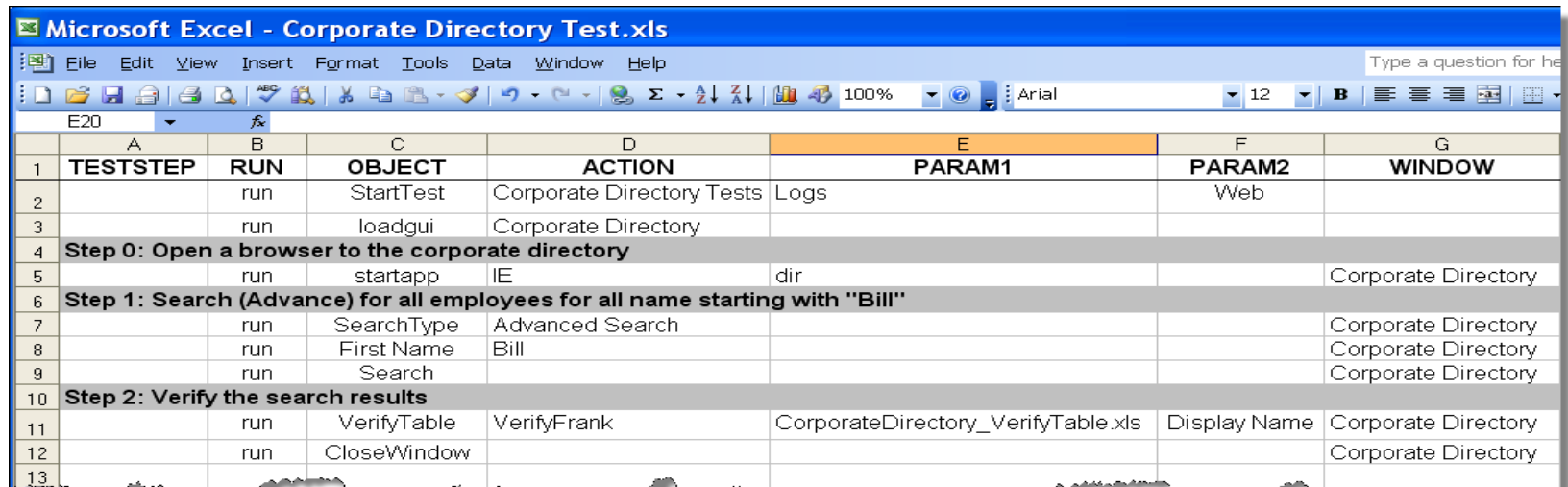
☐ Basic Search ☒ Advanced Search

First Name
Middle Initial
Last Name
Title

Download

Display Name	Title	Four Digit Extension
Bill Bass	Director of Engineering	7090
Billy the Kid	Sr. Software Engineer	-

- Test case:



	A	B	C	D	E	F	G
	TESTSTEP	RUN	OBJECT	ACTION	PARAM1	PARAM2	WINDOW
1		run	StartTest	Corporate Directory Tests	Logs	Web	
2		run	loadgui	Corporate Directory			
3		run	startapp	IE	dir		Corporate Directory
4	Step 0: Open a browser to the corporate directory						
5		run	SearchType	Advanced Search			Corporate Directory
6		run	First Name	Bill			Corporate Directory
7		run	Search				Corporate Directory
8		run	VerifyTable	VerifyFrank	CorporateDirectory_VerifyTable.xls	Display Name	Corporate Directory
9		run	CloseWindow				Corporate Directory
10	Step 2: Verify the search results						
11		run	VerifyTable	VerifyFrank	CorporateDirectory_VerifyTable.xls	Display Name	Corporate Directory
12		run	CloseWindow				Corporate Directory
13							

Automation Summary

- **Need adaptable approach to react to GUI changes**
- **Must be easy to use**
- **Must eliminate redundant work**
 - Automated and manual test cases are the same
 - Share functionality across multiple applications
- **Should be tool independent**
 - Minimize rework to due to changing technology

What is Virtualization?

- **Enables multiple virtual machines to run on a single physical machine**
 - Resources of a single computer shared across multiple environments
 - Different operating systems and applications on the same physical computer
- **Fundamentally changes the way engineering organizations use their hardware resources**
 - Reduces hardware and operating costs by as much as 50%
 - Reduces energy costs by 80%
 - Reduces the time it takes to provision new servers by up to 70%
- **100% of the Fortune 100 companies utilized virtualization**

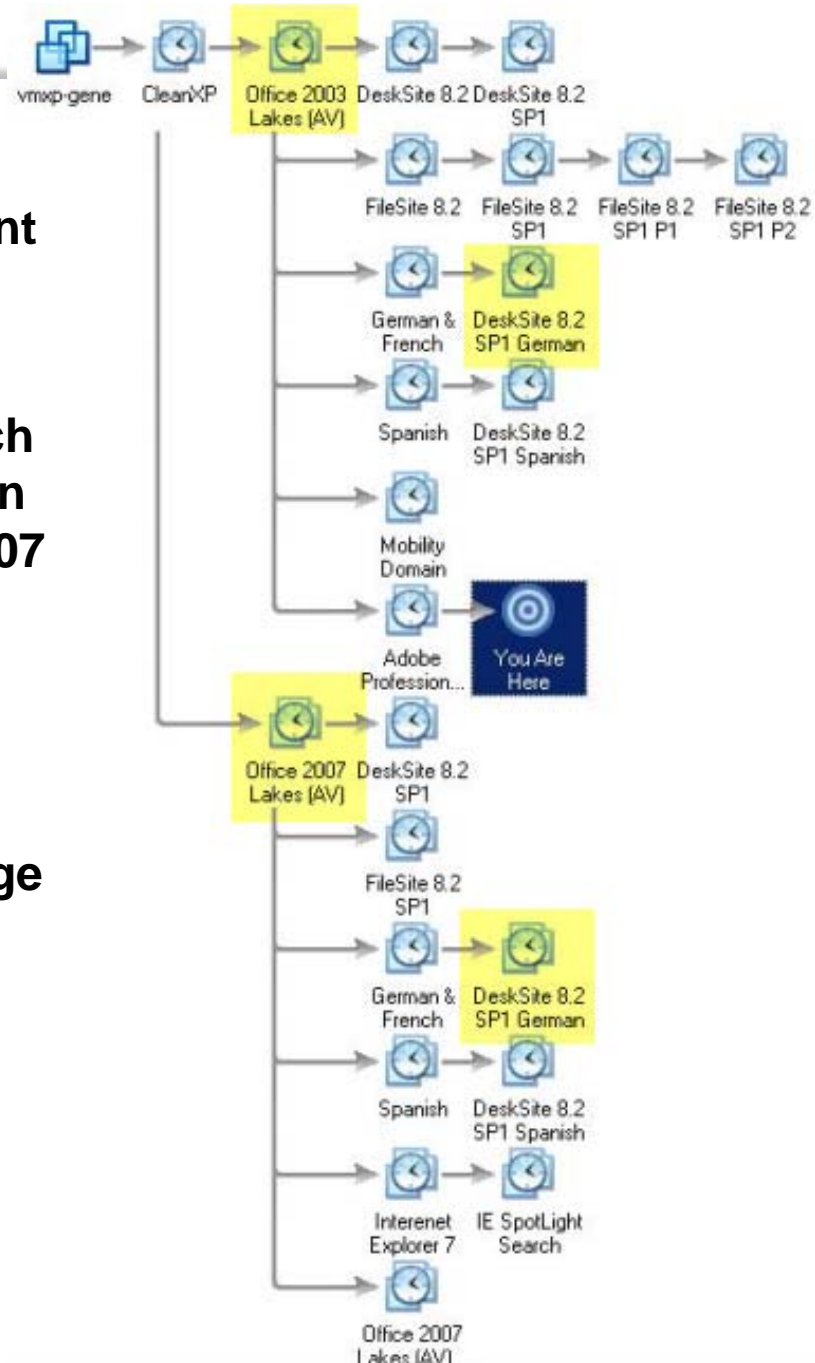
Virtualization Benefits

- **Consistent test environment**
 - Eliminates issues with reproducing defects
- **Portability of environment**
- **Sharing environments not possible due to HW resource contention**
- **Ability to restore environment**
 - Configuration and setup can take over 50% of the test execution time
 - Misconfigured test environment can cause false negatives
- **Time lost to provision, tear-down, and re-provision systems**
 - Eliminations “ghosting” system

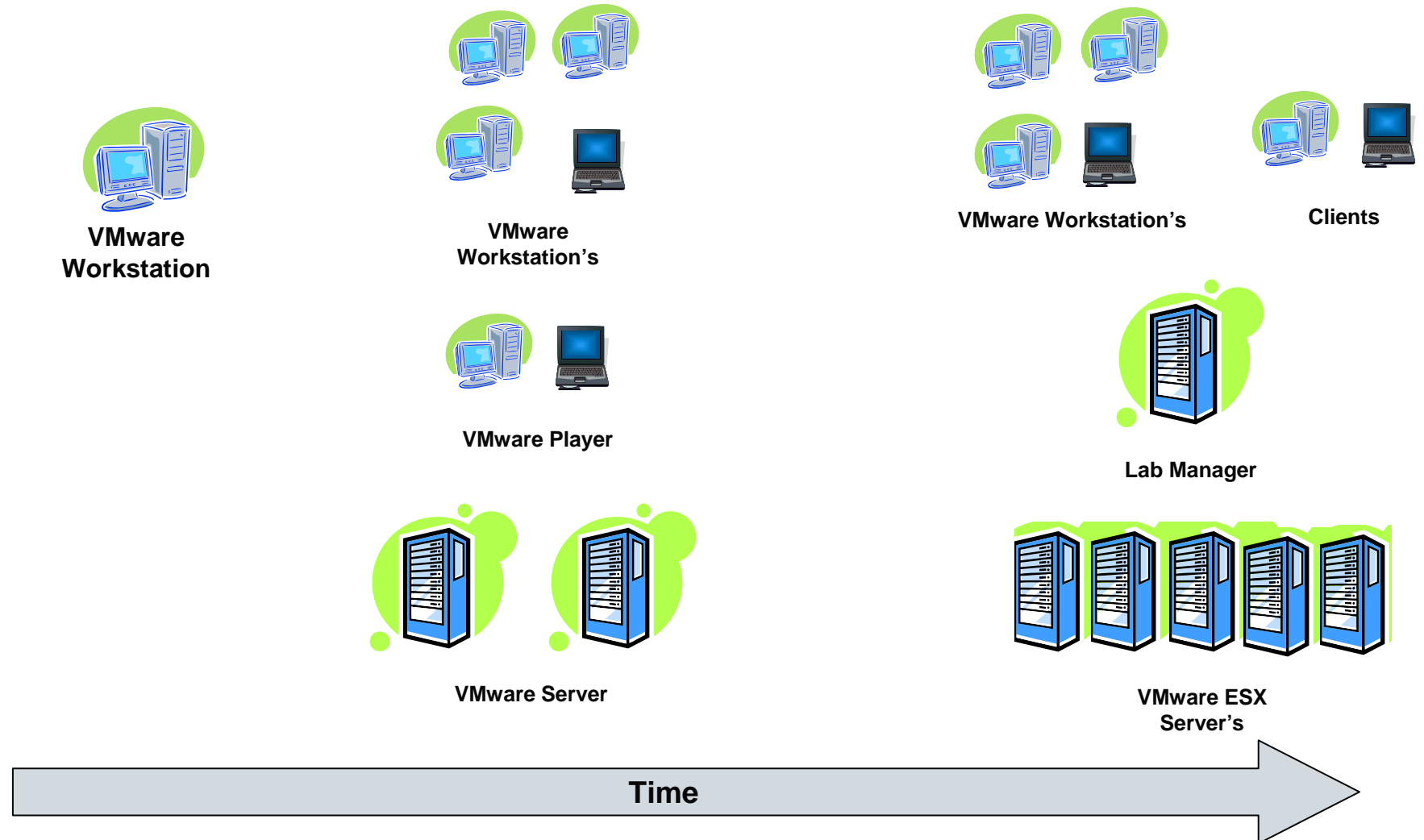


- **Virtualization Example:**

- Language testing for different versions of MS-Office
- Takes only seconds to switch from testing an application in Office 2003 SP1 to Office 2007 SP1
- Test environment is shared with others by a simply copying (“cloning”) the image

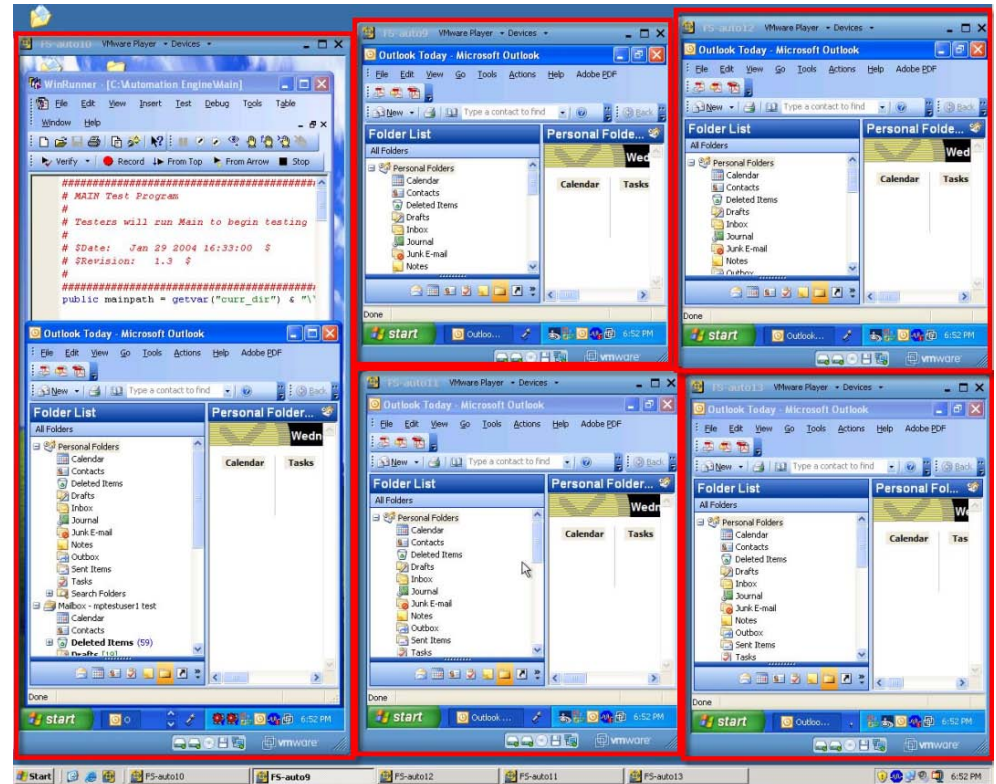


Virtualization Maturity Timeline



Leveraging Automation with Virtualization

- Combining the capability of running multiple VMs with automation greatly improves team productivity with minimum cost
 - Test execution is *monitored* by a junior engineer
 - Can run 8 clients on a <\$2K dual core server with 8 GB RAM
 - Time to execute complete test suite dependent on number of VMs configured
 - Typically achieve a 8:1 productivity improvement



Summary

- **Test case execution in an Agile world is a challenge**
- **Having adaptable, tool independent automation approach is not enough**
- **Leveraging prior virtualization with automation techniques meets this challenge**