IBM developerWorks Live!

Migrating and developing new applications for Linux

Tools to Support Linux Based Team Development
Software Development Process

What is the best way to develop software?

Meet Deadlines
Maximize Efficiency
Competitive Advantage

In the early days, the answer was not obvious
“The Mythical Man Month”

- 25 programmers can complete a job in 6 months
- The job requires 150 programmer-months
- So… 50 programmers could complete the job in 3 months

FALSE!

“The Mythical Man Month,” by Fredrick Brooks
30 Years of Learning From Best Practices

Software Development Process

- Individual Developer Tools
- AD HOC Team Processes
- Systematic Testing
- Iterative Development
- Integrated Development Tools
- Architecture and Modeling
- Integrated Best Practices

Efficiency

Software Development Platform
The IBM Software Development Platform for Linux

**Comprehensive set of team tools that enable proven best practices**

- **Analyst**
  - Model, simulate and monitor business processes

- **Architect**
  - Model applications and data

- **Developer**
  - Construct, program, and generate code

- **Tester**
  - Design, create, and execute tests

- **Deployment Manager**
  - Configuration Management
  - Performance Monitoring

- **Project Manager**
  - Follow a common process
  - Track project status
  - Manage requirements
  - Manage change and assets
  - Manage quality
Rational Unified Process (RUP)

First start with Rational Unified Process.....

- Define your development process
- Customize your usage of best practices
- Formalize development team usage of the four imperatives
- Roles and responsibilities clearly defined
Enabling Best Practices – Four Imperatives

1. Develop Iteratively

2. Focus on Architecture

3. Continuously Ensure Quality

4. Manage Change and Assets
Develop Iteratively

✓ Adopt a flexible process
✓ Create successive iterations of executable releases
✓ Confirm requirements and quality with every iteration

Business Benefits
- Fewer failed projects help reduce costs, minimize waste
- Unify distributed teams, contractors, outsourcers

Technology Benefits
- Mitigate risk early in the project lifecycle
- Remedy the root causes of project failures
- Accurately scope and measure projects
Focus on Architecture

- Create models at various levels of abstraction
- Implement with component-oriented and service-oriented architectures
- Visualize as-built architecture
- Validate or refine & iterate

Business Benefits
- Better align projects with business needs
- Higher-level reuse for improved productivity
- Faster, more reliable changes

Technology Benefits
- Enables model-driven architecture and development
- Scales better than focusing only on code
- Facilitates traceability across the lifecycle
Continuous Ensure Quality

- Build in quality from the beginning
- Automate testing
- Bridge development, testing, and operations teams

**Business Benefits**
- Reliable delivery of unique differentiators
- Rapid cycle times
- Satisfied service level commitments

**Technology Benefits**
- Complete asset traceability
- Accelerated problem determination
- Early detection of system availability risks
Manage Change and Assets

- Manage change
- Manage assets
- Automate and accelerate workflow

Software Configuration Management

- Requirements
- Models
- Code
- Tests...

Business Benefits
- Quickly respond to change
- Develop anytime, anywhere, in parallel
- Enable reuse and protect assets

Technology Benefits
- Flexible workflow and process support
- Distributed team management
- Traceability across the lifecycle
Change Management: The Challenge

Analyst

Did requirement 462 make it into this release?

Of course I didn’t forget a file...

Developers

Integrator

Why did the build break?

Testers

Project Manager

How many severity 1 bugs are left?

Is bug 873 fixed in this build?

Build 3

Build 2

Build 1
Software Development Life Cycle at On Demand Insurance Company

**Business Analysts**
- Document requirements

**Architects**
- Model application and data

**Developers**
- Determine impact
- Check out source code
- Make changes
- Mark complete

**Testers**
- Functional test
- System test
- Document results

**Deployment Manager**
- Deploy to production servers

**Project Managers**
- Start project and track progress
- Assign resources
Comprehensive set of team tools that enable proven best practices
IBM Rational ClearQuest

*Manage defects and change requests*

- Provides activity-based change and defect tracking in a collaborative environment.

- Manages all types of change requests, including defects, enhancements, issues and documentation changes with a flexible workflow process.

- Enables easy customization of defect and change request fields, processes, user interface, queries, charts and reports.

- Provides predefined configurations and automatic e-mail notification and submission.

- Scales easily to support projects regardless of team size, location or platform.

- Tightly integrated within the IBM Software Development Platform.
DEMO: Create Change Request

- Business Analysts
  - Document requirements
  - ClearQuest

- Architects

- Developers

- Testers

- Deployment Manager

- Project Managers
  - Start project and track progress
  - Assign resources
  - ClearQuest
Let’s Consult the Model and Make the Change!

Business Analysts

Architects

Developers

Testers

Deployment Manager

This is the same person at On Demand Insurance Company

- Model application and data
- Determine impact
- Check out source code
- Make changes
- Unit Test
- Mark complete

Project Managers
On Demand Insurance Company Used Modeling

- Understand the bigger picture
  - Static relationships
  - Dynamic relationships
  - Inter-dependencies and impact of changes

- Higher level of abstraction
  - Manage complexity
  - Focus on or filter out details as necessary
  - Multiple, alternate viewpoints

- Team work
  - Improved communication
  - Fewer bugs, less rework

- Productivity
  - Via model based automated code generation and synchronization
  - Reuse of pre-defined or custom designs via patterns
### Lets understand UML Concepts

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| 1. | **Use Case**  
Communicates to the customer what functionality is in the project scope, and who the system actors are. |
| 2. | **Activity**  
Shows the workflow in a business process.                                                   |
| 3. | **Collaboration**  
Shows the objects participating in a scenario of a use case, how the objects are related, and the messages sent between the objects. |
| 4. | **Sequence**  
Shows the objects participating in a scenario of a use case, how the objects are related, and the messages sent between the objects. Similar to collaboration diagram but in a different format. |
| 5. | **Class**  
Diagrams the classes or subset of classes in a system along with their relationships, attributes and operations. |
| 6. | **Statechart**  
Shows the dynamic behavior of an object, including the states that it may exist in.     |
| 7. | **Component**  
Shows the physical components that make up a system.                                      |
| 8. | **Deployment**  
Addresses how the system will be deployed.                                                 |
DEMO: Use the Model to find out how to make the change

- **Business Analysts**
  - Model application and data
    - ClearQuest
    - Rational Application Developer

- **Architects**

- **Developers**
  - Determine impact
  - Check out source code
  - Make changes
  - Mark complete

- **Testers**

- **Deployment Manager**

- **Project Managers**
IBM Rational ClearCase
Software Configuration Management

- Workspace Management
  - Assures integrity of all software elements

- Version Control
  - Creates versions of all types of files and directories

- Build Management
  - Traces and reproduces builds accurately for every release

- Process Control
  - Customizes Process
  - Records and reports actions, history, and milestones
Unified Change Management

ClearQuest and ClearCase are tightly integrated in a unified manner.
DEMO: Make the Change

Business Analysts
- Model application and data

Architects

Developers
- Check out source code
- Make changes
- Mark complete
- RSA
- ClearQuest
- ClearCase

Testers

Deployment Manager

Project Managers
Code Analysis Capabilities in Rational Application Developer

- **Static source code Analysis**
  - Source code analysis for rule violation detection: Java/EJB coding practices, internationalization, accessibility, architectural constraints, API deprecation

- **Dynamic Runtime Analysis**
  - Sequence diagram runtime trace with performance, thread and code coverage annotation
  - Advanced memory leak detection
  - Line Level Code Coverage
  - Remote data collection across multiple servers
  - User-defined run-time probes
  - Interactive reports and metrics
DEMO: Code Analysis

- Business Analysts
- Architects
- Developers
  - Code Coverage analysis
    - RAD
      - Profiling
- Testers
- Deployment Manager

Model application and data

Project Managers
Testing Capabilities in Rational Application Developer

- Java class, EJB and Web Services components testing
  - Based on the JUnit framework
- Provide testing guidance
  - What to test first based on static metrics
- Automated test case generation
  - Based on test patterns
- Data driven testing
- Automated regression testing
- Integrated with Code Coverage
- Change management support through integration with ClearCase & ClearQuest
- Implementation of the OMG Testing Profile
DEMO: JUnit Testing

- Business Analysts
- Architects
- Developers
  - Unit testing
    - RAD
      - JUnit
- Testers
- Deployment Manager

Project Managers
IBM Support for Linux Developers and Partners

A Road Map to get started

Developers

Partners
Robust IBM Middleware Software for Linux Development on Your Linux SEK DVDs...

www.ibm.com/developerworks/offers/linux-speed-start

Content of Software Evaluation Kit

- **DB2 ®**
  - DB2 Universal Database Enterprise TM Personal Developers Edition,(PDE), V8.1.3 for Linux for Intel Evaluation

- **Tivoli ®**
  - Tivoli Access Manager Base V4.1 for Linux

- **Lotus ®**
  - Lotus Domino 6.02 CF! for Linux

- **Web Services**
  - WebSphere SDK for Web Services V5.1 for Linux

- **WebSphere ®**
  - WebSphere Application Server, Version 5.0 for Linux Evaluation
  - WebSphere Studio Site Developer for Linux, Version 5.1 Evaluation

Evaluation software for Linux on IBM iSeries and pSeries servers also available!
## developerWorks Subscription

- One fee for 12-months of continuous access and updates
- Convenient one-stop access: online downloads, and Custom CDs or Issue Cds
- Comprehensive variety of IBM development tools, middleware and technologies
- Single-user license to develop and test software
- Support not bundled, per-incident basis only
- Choice of three subscription levels

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<th>Starter Level - $499 USD</th>
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| **Web development**  | - WebSphere Studio Site Developer  
- WebSphere, DB2, Lotus, Tivoli, Linux, and more  
- Rational trials                                                                                                                                          |
| **Professional Level - $1749 USD** | **J2EE development** - WebSphere Studio Application Developer  
- Collaboration – Lotus Domino Designer  
- Data management – DB2 personal, Informix  
- Tivoli – Storage Resource Manager  
- plus Starter Level contents |
- Enterprise Modernization – WebSphere Studio Enterprise Developer  
- WebSphere Portal Extend, Transactions  
- Data management – DB2 Enterprise, Warehouse  
- Tivoli - web security, storage manager  
- plus Professional Level contents |

ibm.com/developerWorks/subscription
Test Drive Linux Program

- ISV’s test their Linux Application on all IBM eServer platforms for no-charge limited access or fee-based extended access
- Lower development costs and increased speed to market
- Open new markets and expand customer base with simple recompile
- Remote access from around the world, utilizing the latest security technologies like VPN, AES, SSH, SCP
- Technical support through voice, email, FAQ’s and forum is provided to assist with identifying defects
- Get going with www.ibm.com/servers/enable/linux/testdrive
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- Technical workshops & seminars

**Technologies**
- e-business on demand
- Express products for SMB
- Data Management
- eServer
- Java technology
- Lotus
- Pervasive computing
- Storage
- Grid computing
- Tivoli
- Web services
- WebSphere

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- Chicago
- Dallas
- Pittsburgh
- San Mateo
- Sao Paulo
- Toronto
- Waltham

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- Budapest
- Helsinki
- Hursley
- Paris
- Petach-Tikva
- Prague
- Stuttgart
- Warsaw

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- Seoul
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- Sydney
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  - Comprehensive free technical resource for the developer community
  - Presentations from this seminar can be downloaded in PDF format
Let's Now Consider Linux Collaboration Solutions to Replace Microsoft Office!