RepoGuard
Validation Framework for Version Control Systems

Remidi09 (2009-07-13, Limerick)

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Outline

Software development at the DLR
• Facts, Scientific Software Development

Problems
• Motivation

RepoGuard
• Architecture, Workflow, Configuration

Conclusion
• Benefits, Q&A
DLR
German Aerospace Center

- Research Institution
- Space Agency
- Project Management Agency
Locations and employees

6000 employees across 29 research institutes and facilities at

- 13 sites.

Distributed Systems and Component Software

About Us

Main Department for Software Engineering

Grid-Computing

- Development of Grid-enabled applications
- Grid security …

Management Tools for scientific data

- Expert systems for computational fluid dynamics
- Data management tool DataFinder …

Software Engineering

- …

Provide Infrastructure for Software Engineering
Scientific Software Development
Daily Observations in Research Institutions…

Lots of scientists work on large/critical software

- Mathematicians, physicists, engineers

Main Goal: Fast implementation of ideas into running code

Knowledge about Software Engineering varies a lot

- Use of archaic tools and procedures

Typical situation: Small scripts grow large

Very different team sizes

- From 1 student to >50 developers
Motivation
Different Approaches to Change the Situation

First: Training
➤ Knowing how to do it right

BUT: Developers are like cats

Second Approach: Force
➤ Need to do it right
Motivation
Loosely coupled Development Tools

IDE
Repository Browser
Wiki
VCS
RepoGuard
Bug Tracker
E-Mail

All Tools are...
Open Source
Replaceable
Automatic Server Side Transaction Check
What does RepoGuard do?

The Tao of Source Control:
“If it’s not in the repository, it doesn’t exist.”
RepoGuard
What is RepoGuard exactly?

Validation framework for VCS
▷ Validation before storing changes

Provides a unified interface for validation and reporting
▷ Easy access to the transaction and external tools

Links everything to your VCS
▷ Most developer tools are loosely coupled

Written in Python
▷ Easy and powerful
Checks
What can be checked…

Everything that is related to a transaction

Validate Transactional Content
- Coding Style: Pylint, Checkstyle, ASCII Encoded, …
- Source Code Analysis: Findbugs, QA C/C++, …
- XML, HTML, …

Validate External Information
- Bug/Issue Ids

Extending VCS
- Access Rights
Handler
What is possible…

Handler as *reporter*
- E-Mail
- Log File
- Console
- Database
- Bug Tracking System
- RSS Feeds
- Blog post
- Twitter

Handler as *trigger*
- Hudson
- ViewVC
Modularized Architecture
Integrate whatever you want…

Checks
- Create your own validation routines

Handlers
- Create your own reporting or trigger routines

Bug Tracking Systems
- Specialized interface for BTS integration

Version Control Systems
- No special VCS required
- Support of VCS extensible
Order of Check Executions
Things you should know in advance

Checks are linked as a workflow

- Results of the check can be “Success” or “Error” and a message

“Error” check results can be translated to…

- Warning: Check is optional
- Delayed Error: Continue workflow execution
- Error: Abort workflow execution

All results stored in a protocol

- Final result of the protocol determines whether the transaction is accepted or rejected

Final result handled by „Success“ or „Error“ Handlers
Workflow
Execution of Checks and Handlers

IDE e.g. Eclipse

Commit message: MANTIS 42
Something to commit

Content of Remidi09.java:

```java
class Remidi09 { static void main{} }
```

Keywords set for Remidi09.java:
IdLastChangedRevision

Access Rights for Remidi09.java:
Permission denied

Content of Remidi09.java:
class Remidi09 { static void main{} }

Succes-Handler
Mantis
E-Mail
Hudson

Error-Handler
Console
E-Mail
Log File
Configuration

Configuration of the Workflow, Checks and Handlers
- All in one rich property file
- Key-Value-Pairs arranged in groups and subgroups

Validation of Configuration
- Validation before using in a productive environment

Configuration Templates
- Reduce your overhead between configurations
- Configuration hierarchy
- Inheritance mechanism
Command Line Tool
Easy Use of RepoGuard

Administration
- Easy installation and removal of RepoGuard in repositories

Validation of Configuration
- Validate your configuration file before using in a productive environment
- Configuration support

Extensible Command Line Tool
- Integrate new functionality for RepoGuard configuration
Benefits of RepoGuard
Why you should use it!

Better integration of Version Control in the development process
> Especially the connectivity to the Bug Tracking System

Stay informed about what happens in your Repository
> Reporting over all communication channels possible

Keeping your repository under surveillance
> Detection and rejection of mistakes
> Increase of the overall source code quality

Turn your developers into well-behaved cats
Conclusion
Where can I get it?

Availability
- Open-Source (Apache License V2.0)
- More information and download at...

http://repoguard.tigris.org

Contact
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Q&A
Questions and maybe Answers