



# RepoGuard

## Validation Framework for Version Control Systems

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# Outline

## Software development at the DLR

- Facts, Scientific Software Development

## Problems

- Motivation

## RepoGuard

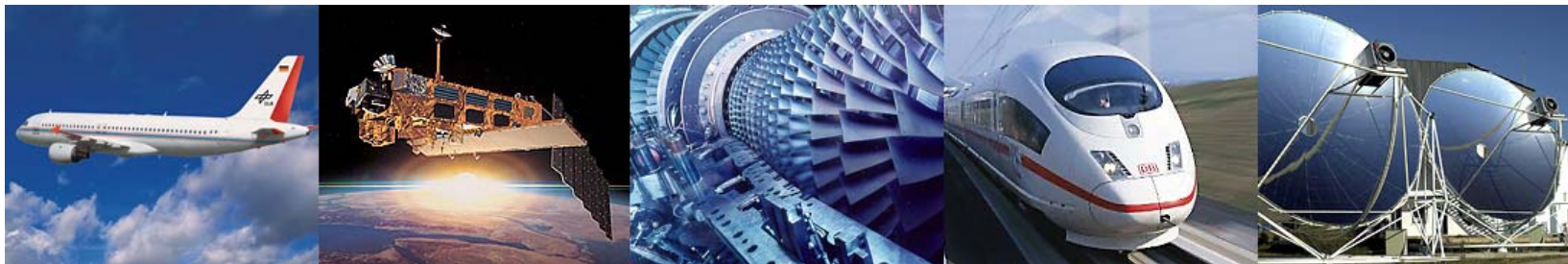
- Architecture, Workflow, Configuration

## 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.

Offices in Brussels,  
Paris and Washington.





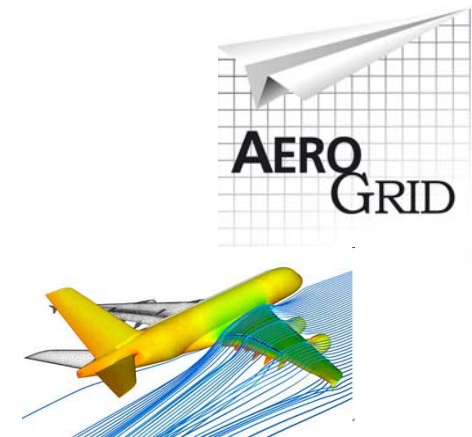
# Distributed Systems and Component Software

## About Us

### Main Departement 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

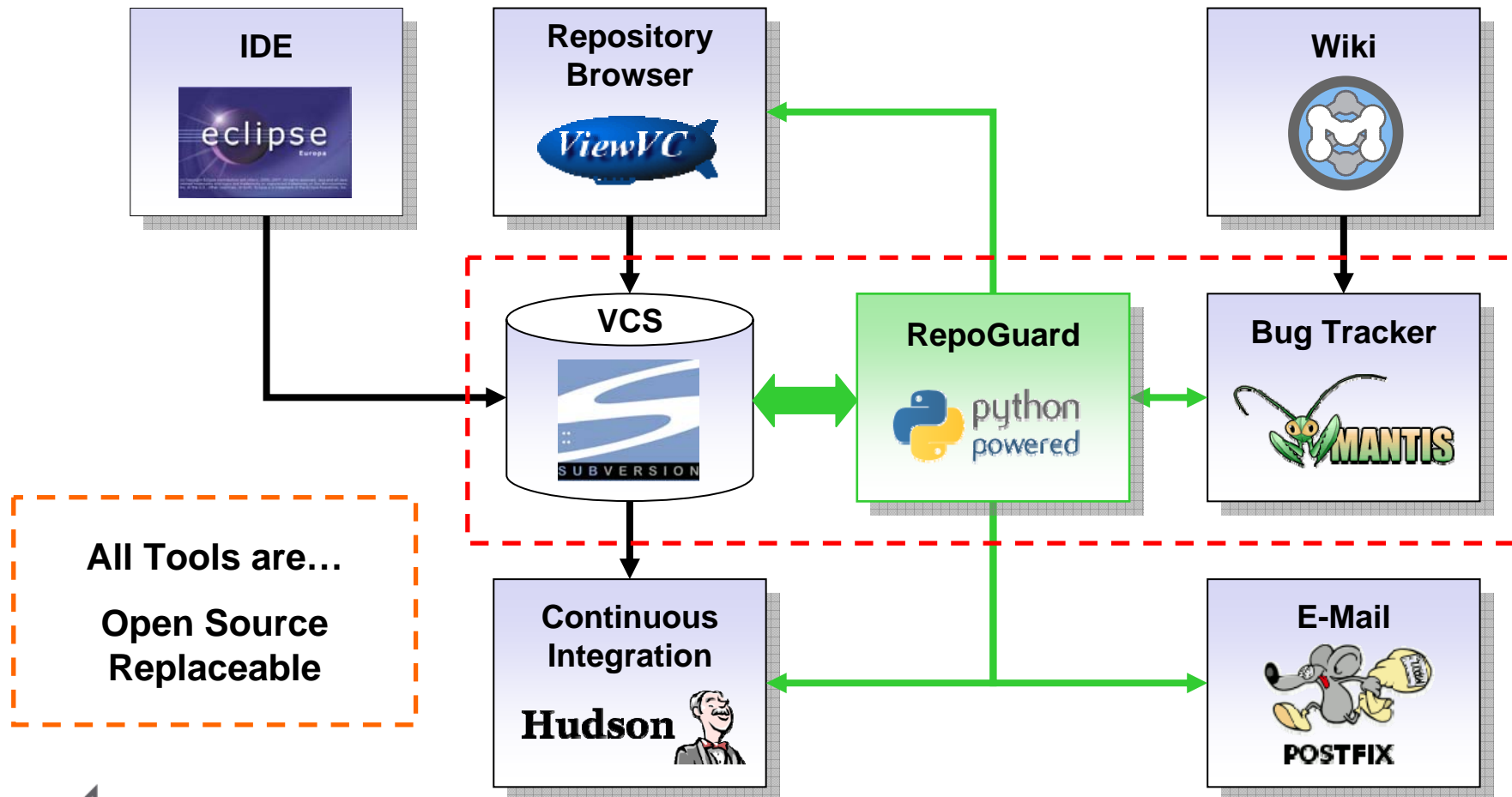
- Need to do it right





# Motivation

## Loosely coupled Development Tools







# RepoGuard

What is RepoGuard exactly?

## Validation framework for VCS

- Validation before storing changes

## Provides a unified interface for validation and reporting

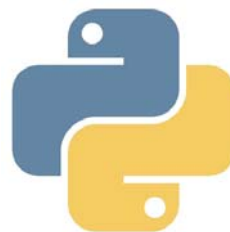
- Easy access to the transaction and external tools

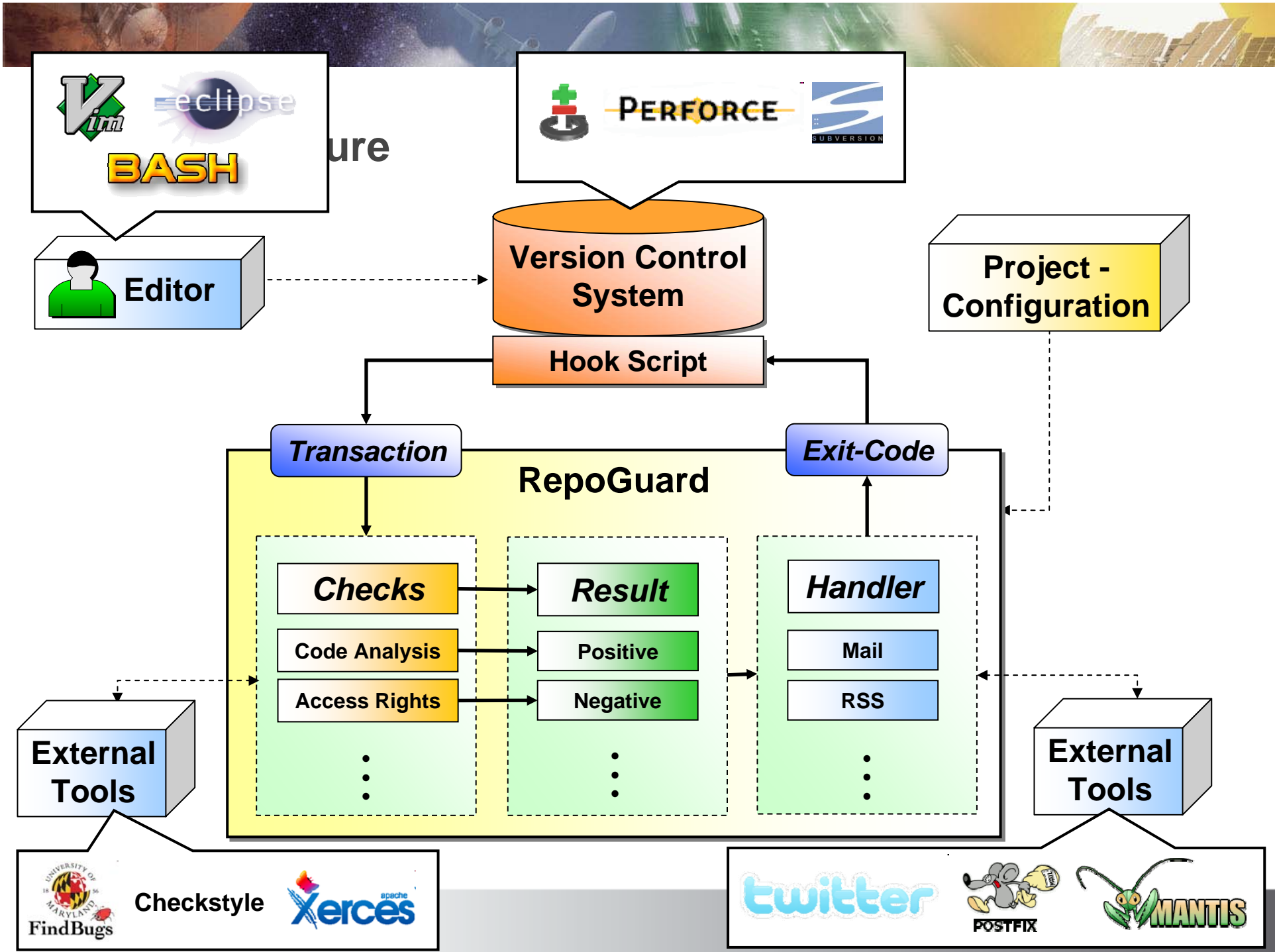
## Links everything to your VCS

- 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

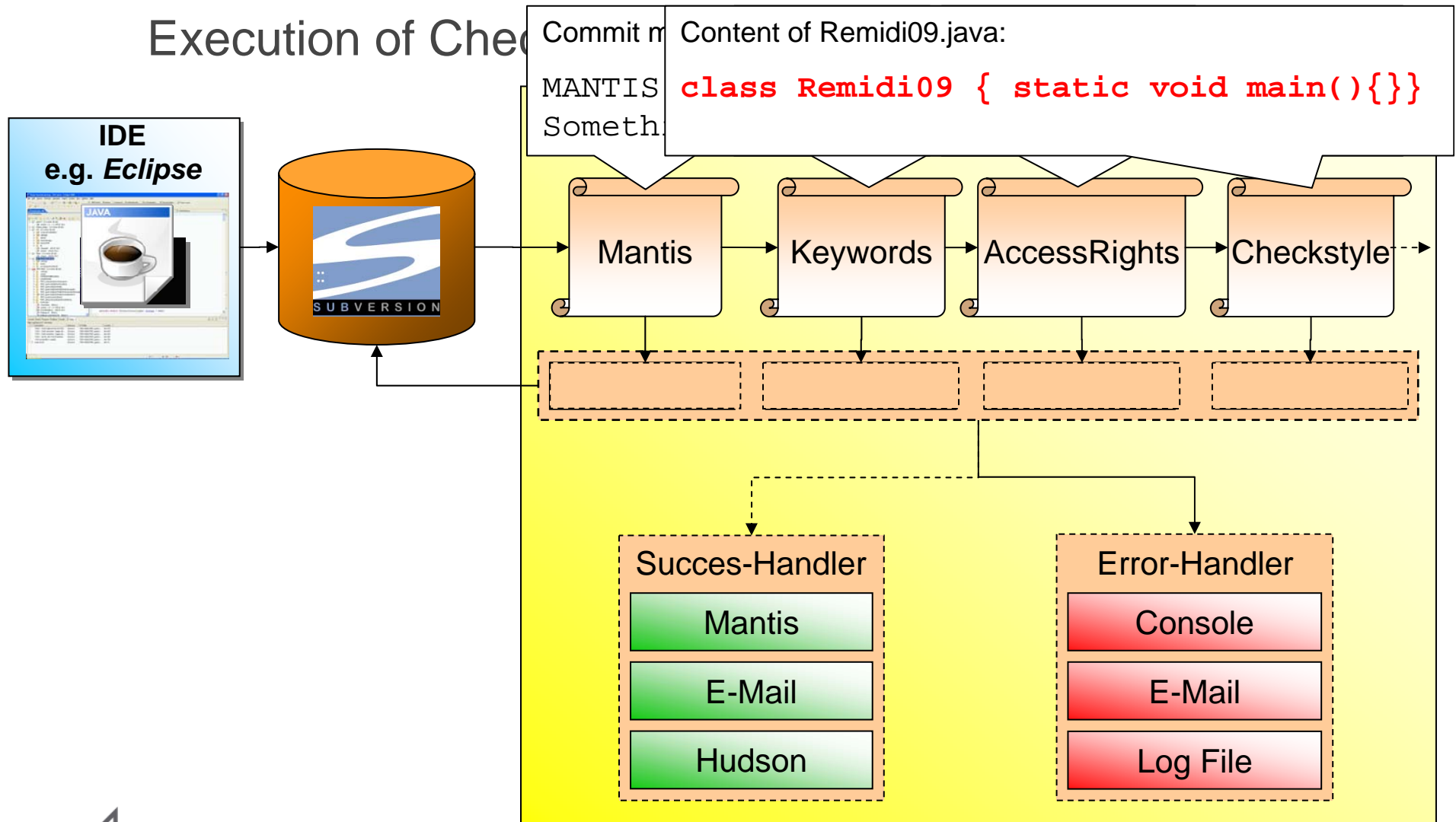
- Final result of the protocol determines whether the transaction is accepted or rejected

### Final result handled by „Success“ or „Error“ Handlers



# Workflow

## Execution of Checkstyle





# 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

