Continuous Delivery

Prof. Dr. Dirk Riehle

Friedrich-Alexander University Erlangen-Nürnberg

AMOS F02

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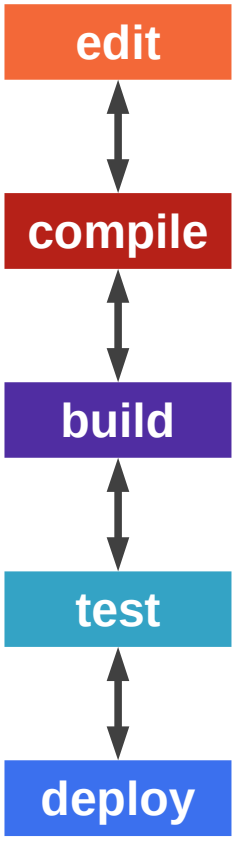
Beginner's Development Cycle



- Developer
  - Edit: Implements new feature
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  - Compile: Compiles the code
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  - Build: Puts classes, build path together
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  - Test: Tests the program
    - Keeps going until "behavior looks right" i.e. no bugs
  - Deploy: Puts code into production
    - If a student, submits homework

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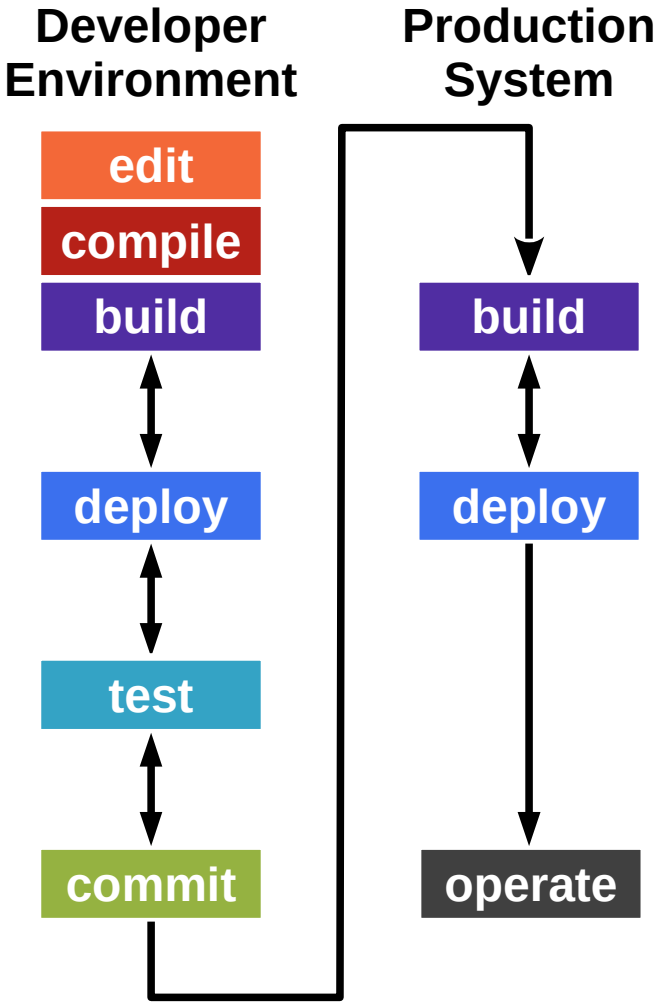
Practitioner's Development Cycle



- Developer
  - Finishes development work
    - Uses local edit-compile-test cycle
    - Commits to indicate finishing
  - Builds for production environment
    - Could possibly use local build
  - Deploys to production system

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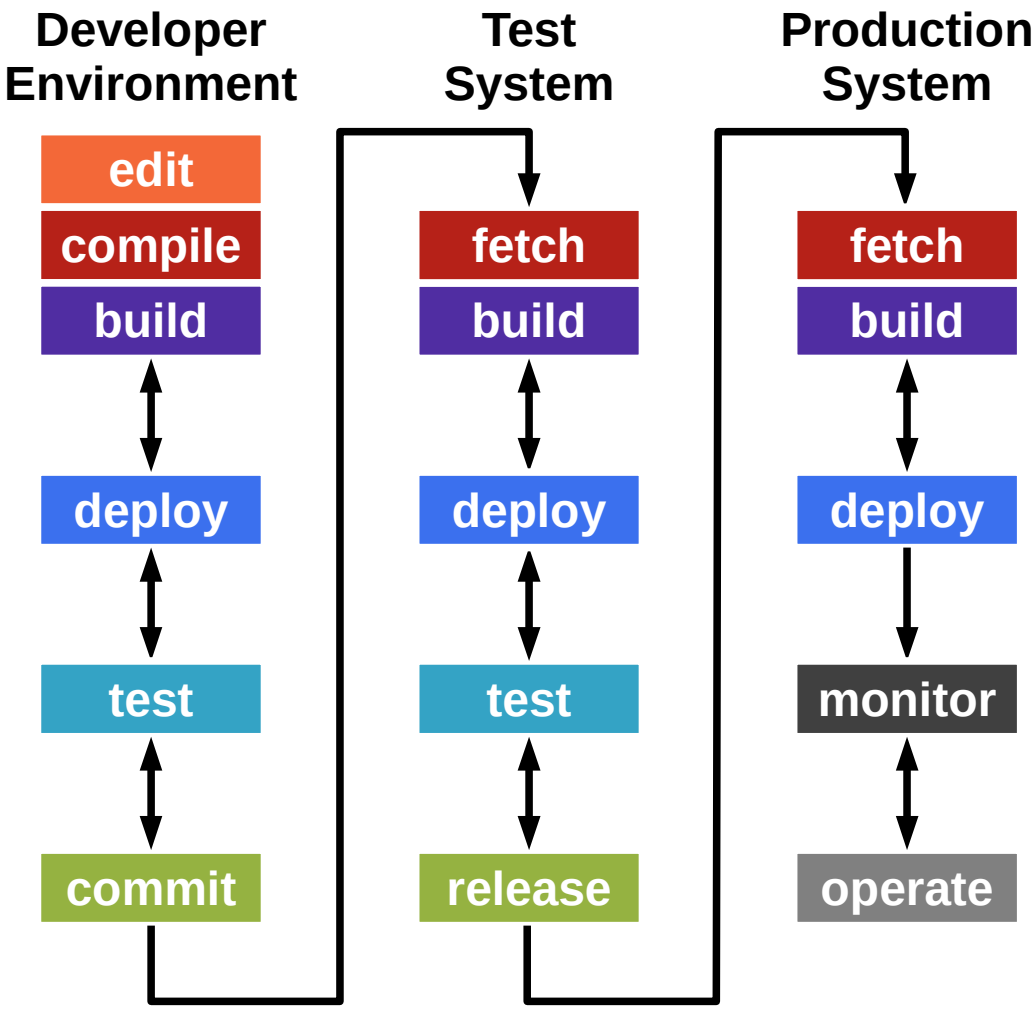
Professional Development Cycle



- QA engineer
  - Fetches code
  - Builds full system
    - Deploys in test system
  - Tests full system
    - Automated and by-hand
      - Component tests
      - Acceptance
      - Integration tests
  - Deploys full system
  - Operates system

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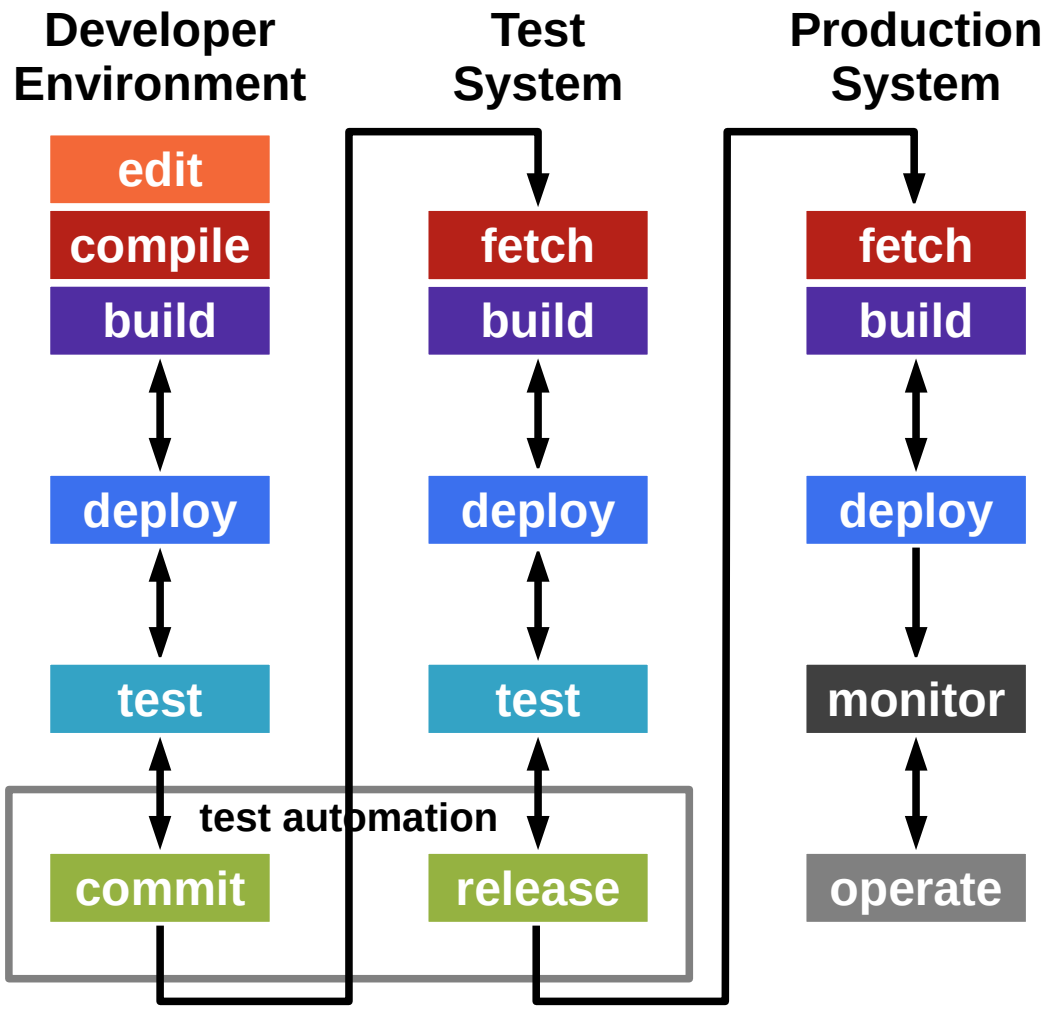
Continuous Integration Development Cycle



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Test Automation

- Test automation ...
  - automatically carries out all available tests
    - Component tests (unit tests)
    - Acceptance tests (functional tests)
    - Integration tests and system tests
  - provides feedback to development and QA

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Continuous Integration

- Continuous integration (CI) is a code integration process
  - Upon trigger (commit to official repository)
    - the system under construction is fetched, built, deployed, and tested
    - in a fully automated way (no human intervention)
  - Feedback upon system status is provided to both
    - developers and
    - managers
- The purpose of continuous integration is to
  - always know where you are standing with respect to the project
  - ideally improve quality such that you can deploy at any time
- Continuous integration requires test-driven development

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Continuous Integration and Lava Lamps

In the early days, lava lamps were used to signal whether the project could be deployed to production or not.

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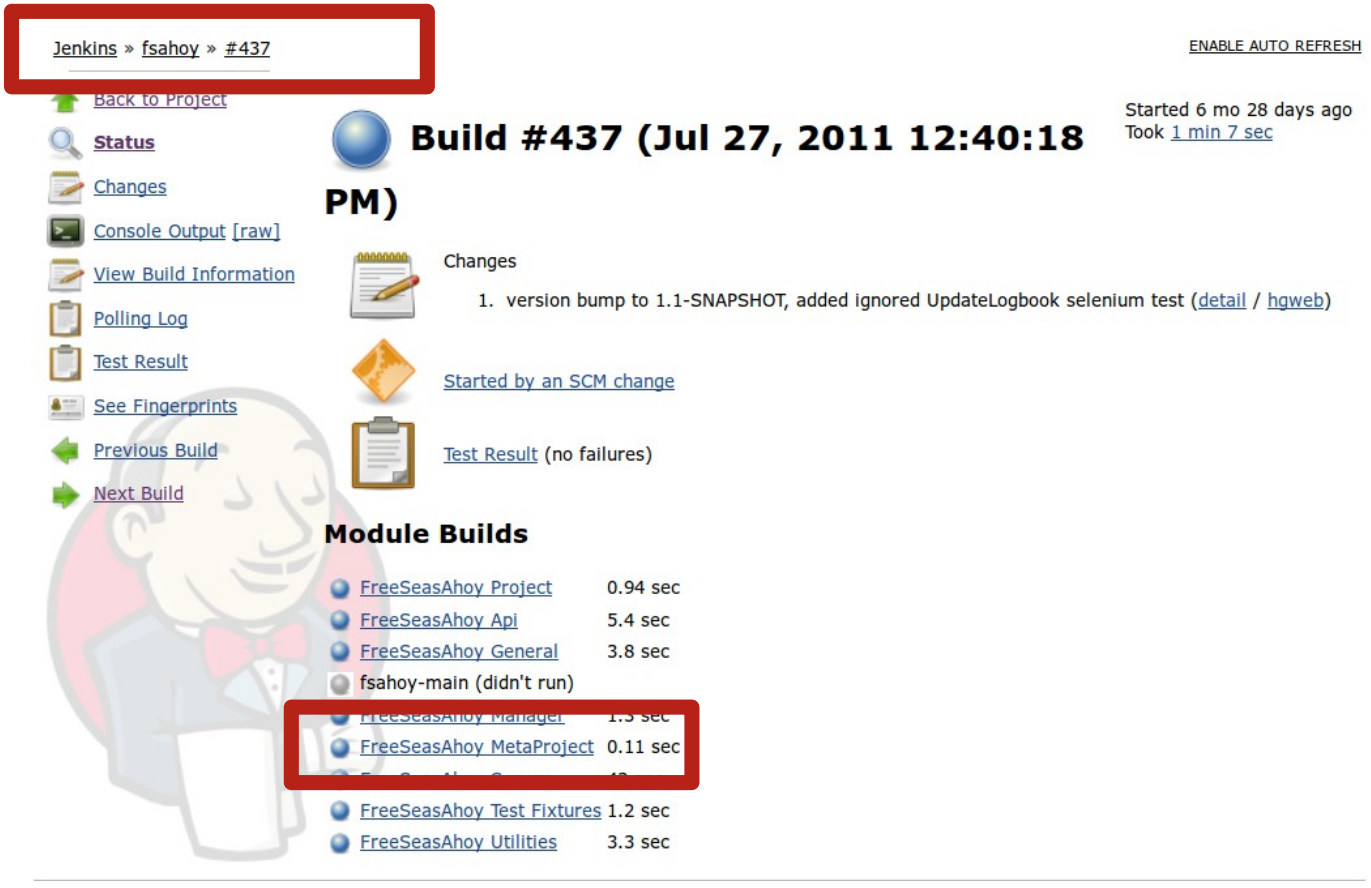
Continuous Integration Dashboards

Continuous integration quickly evolved to build and test status dashboards hung on office walls for everyone to see.

Example Dashboard Build #437



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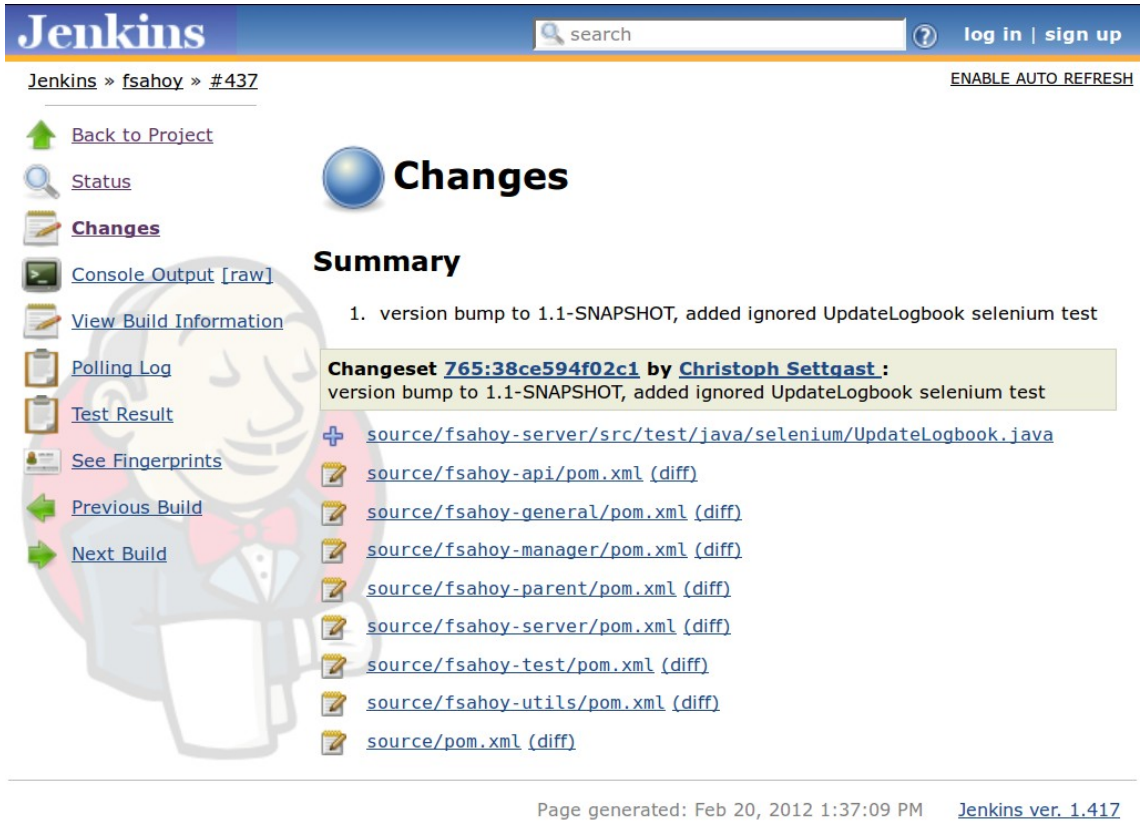
Example Dashboard Changes #437



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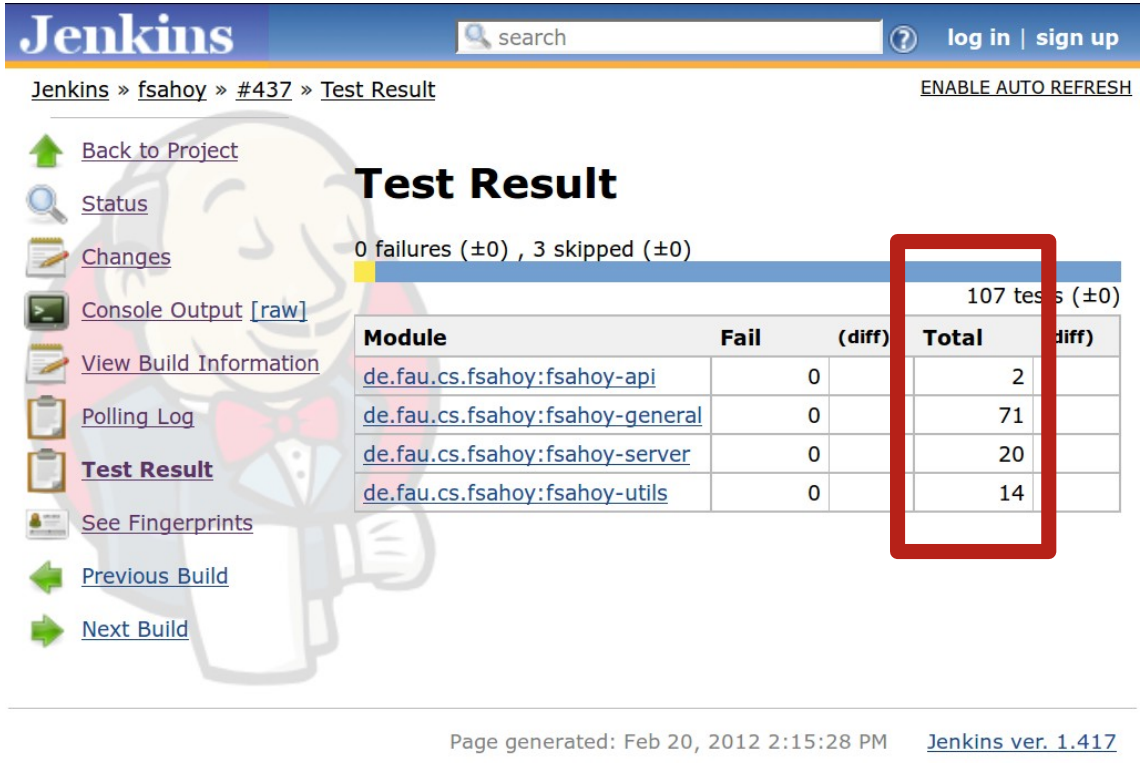
Example Dashboard Test Results #437



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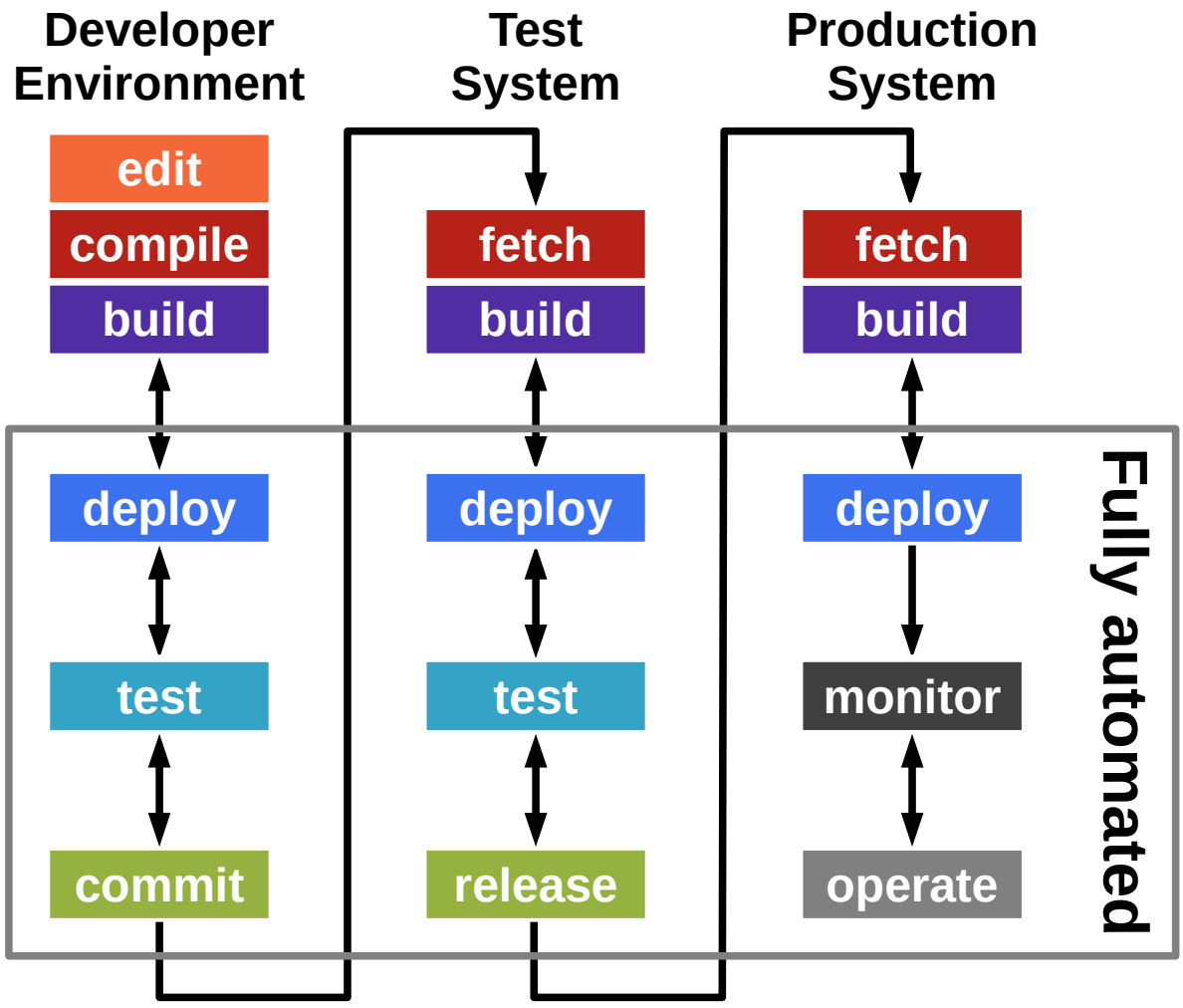
Continuous Deployment Development Cycle



- Fully automated
  - Compile and build
  - Deployment
    - To test environment
    - To production
  - Test execution
- Partially automated
  - System monitoring
  - Automated rollback
- Human decisions
  - Commit decision
- No release decision

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Continuous Delivery

- Continuous delivery is a delivery process
  - Upon trigger (commit to official repository)
    - the system is integrated, tested, and **deployed to production**
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  - A poorly functioning system may be rolled back
    - Requires monitoring and rollback facility of deployed system
    - System status is assessed using key figures
- The purpose of continuous delivery is to
  - put development results into production as fast as possible
  - improve quality by holding the team to high operational standards

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Continuous Delivery 1 / 2

1. Test automation
2. Continuous integration
3. Continuous deployment [1]

[1] Short for “development operations”

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Continuous Delivery 2 / 2

- Test automation =
  - Tests and testing
- Continuous integration =
  - Test-driven development +
  - Automated building +
  - Test automation
- Continuous deployment =
  - Continuous integration +
  - Deploy to production +
  - Monitoring and rollback
- DevOps
  - Continuous deployment +
  - Operations and culture

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Review / Summary of Session

- Continuous delivery
  - Test automation
  - Continuous integration
  - Continuous deployment
  - Development operations

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Thank you! Questions?

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  - ...

Continuous Delivery

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It is Friedrich-Alexander University Erlangen-Nürnberg – FAU, in short.

Corporate identity wants us to say “Friedrich-Alexander University”.

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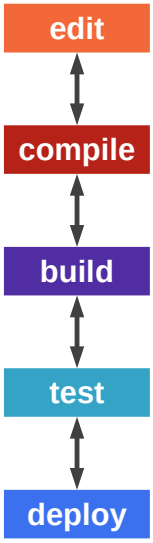

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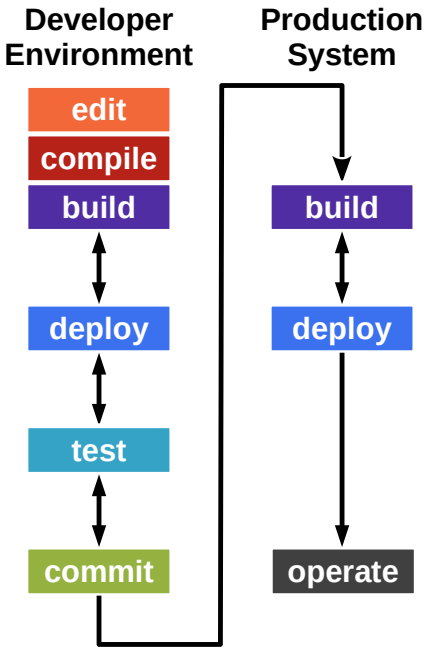

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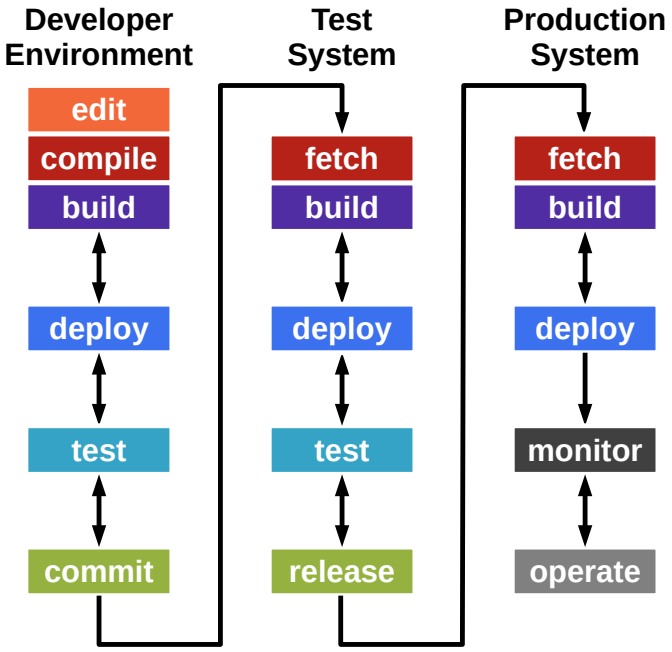

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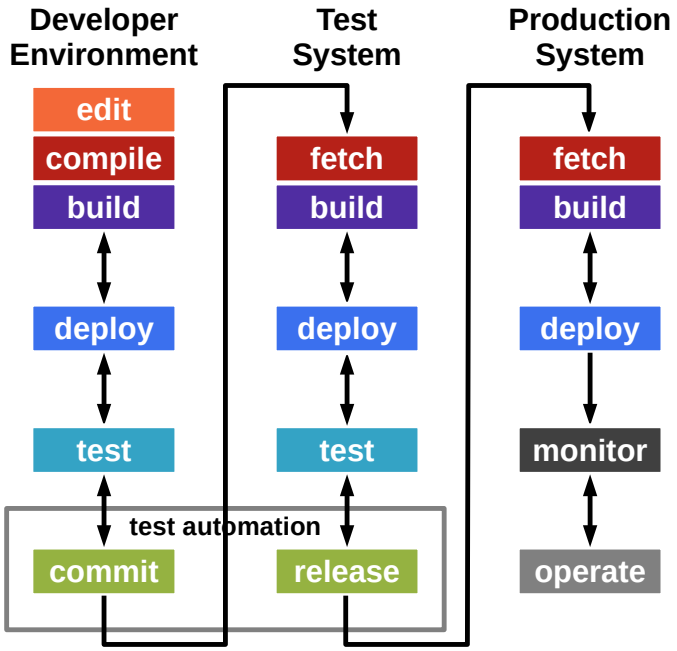

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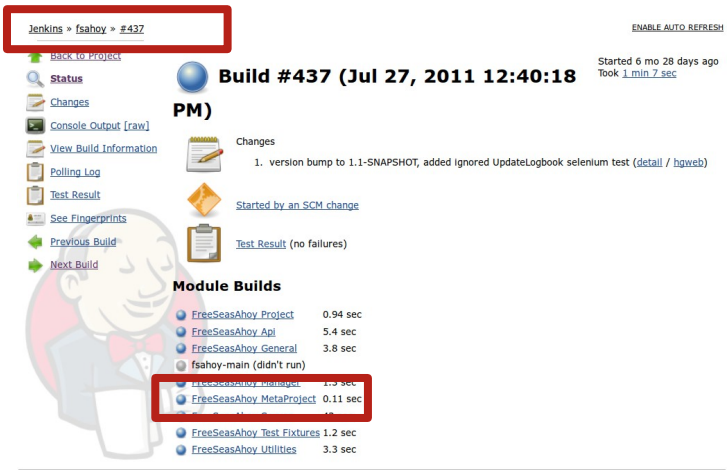

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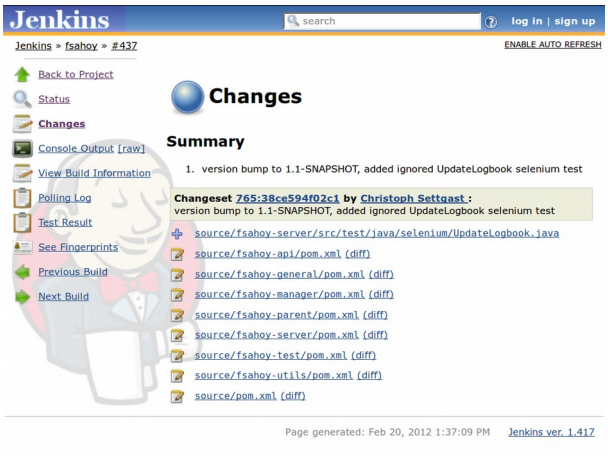

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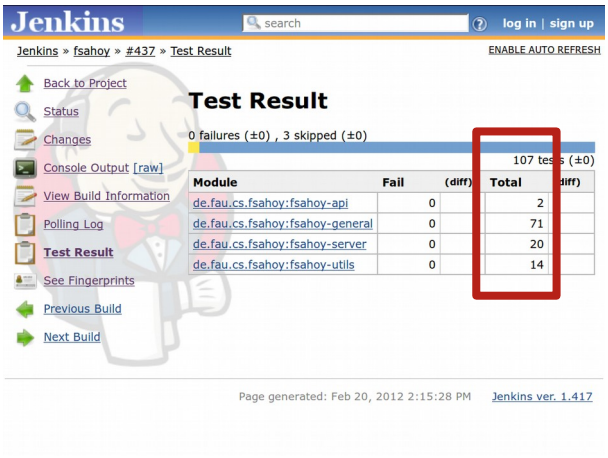

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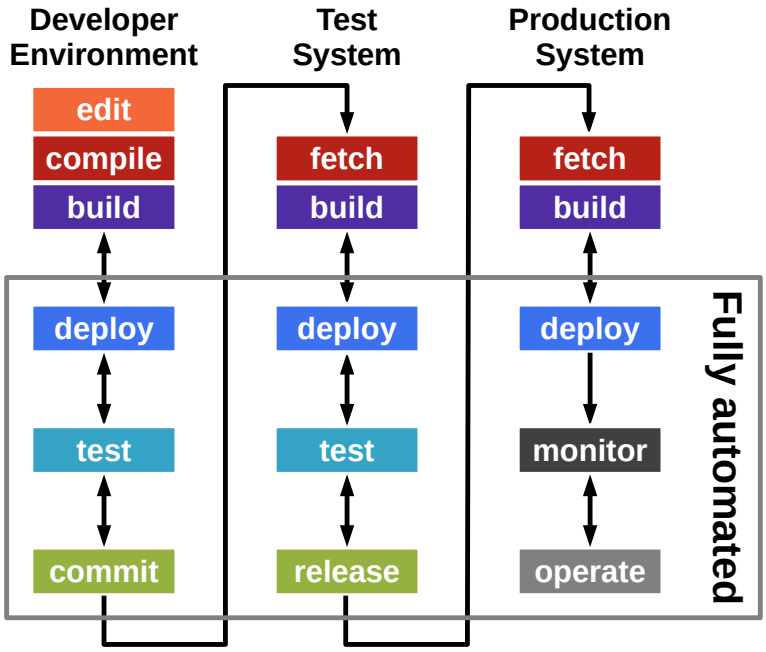

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  - Development operations

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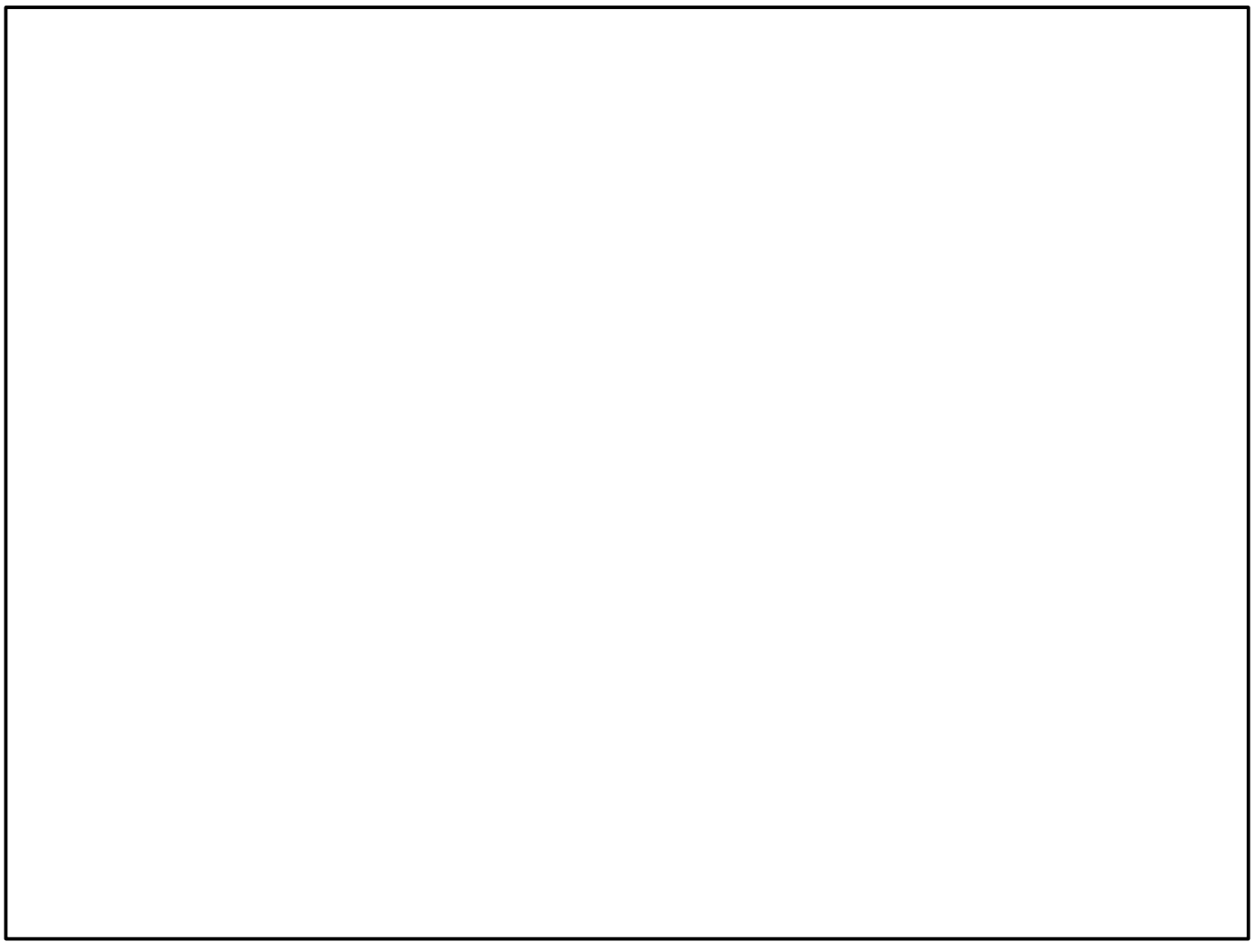
DR



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