

Software Development Practices

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Software Development is about ...

Critical factors of Software Delivery

Project
Management

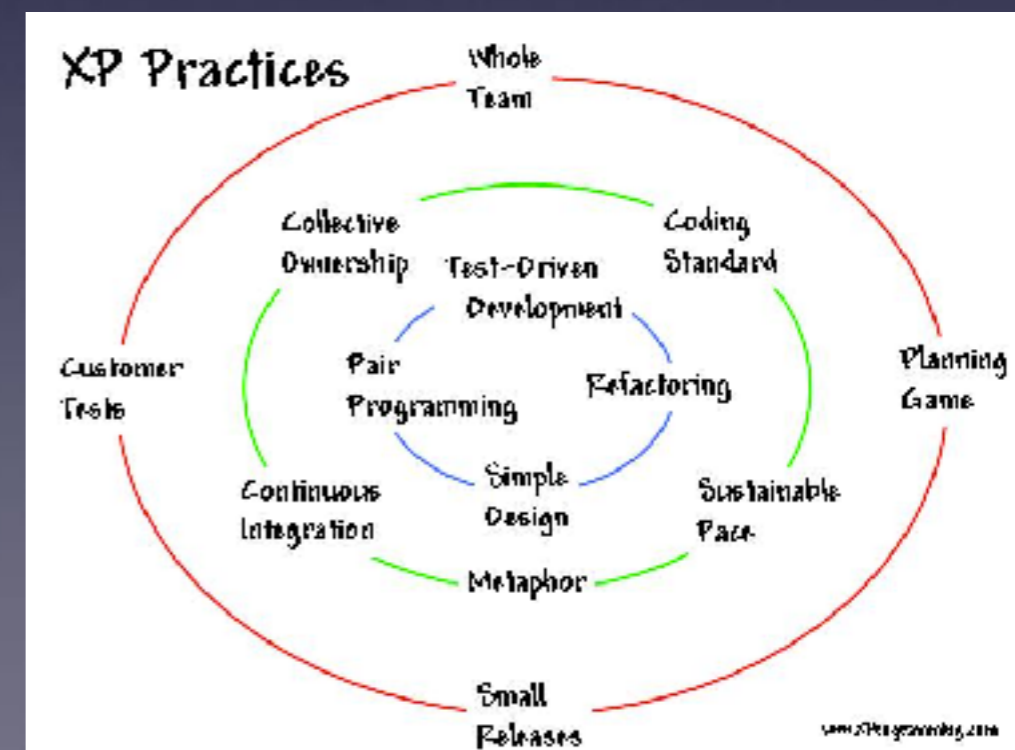
Team Collaboration

Continuous
Integration

Issue Tracking

What I won't cover in this session

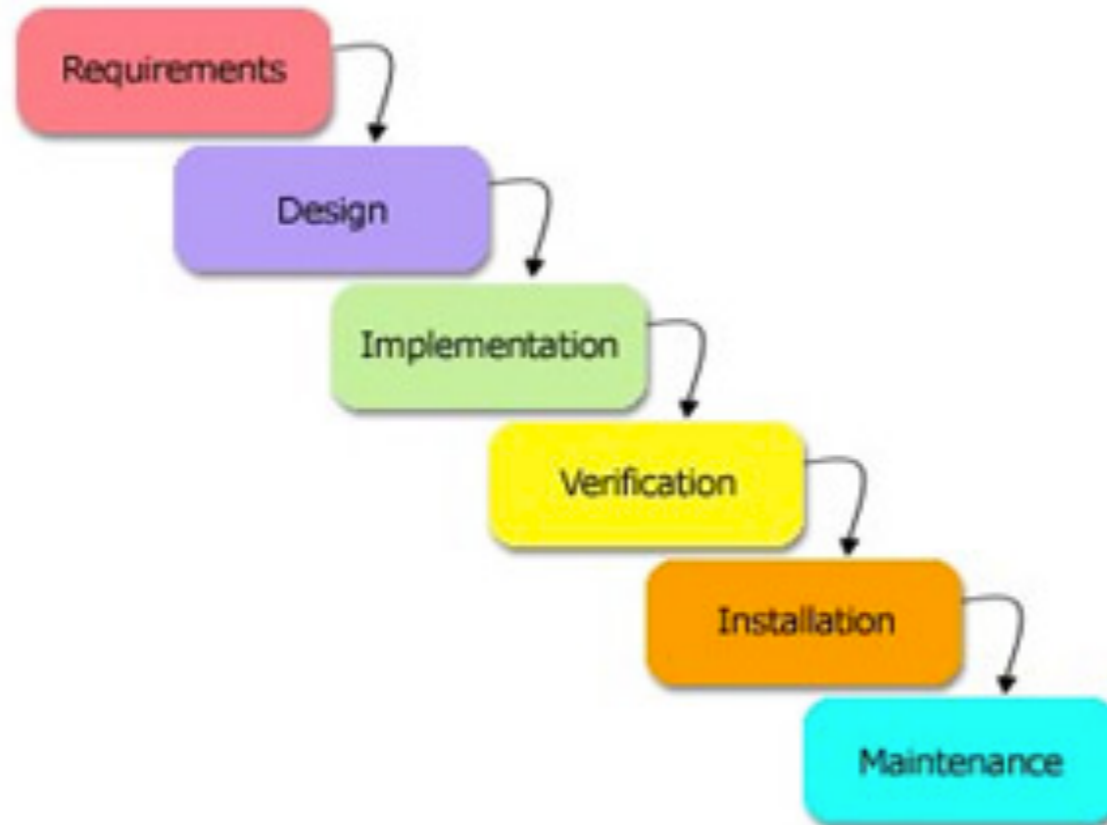
- Pair Programming
- Test-Driven Development
- Refactoring
- ...



Agile Development Process

What is Agile ?

What is the problem of waterfall development process



- Risk
- Cost
- **Satisfaction**

When to use waterfall development process ?

- When requirement and schedule are well-defined
- Quality is more much important than cost
- The uncertainty of technology and external impacts are low

Agile in a Nutshell

- Not just a set of methodologies
- Not just a set of practices
- It feels like a set of goals, principles, or values
- Do what you need to do to leverage instead of resist changes
- Reduce Risk
- Communication, Feedback, Simplicity, Teamwork

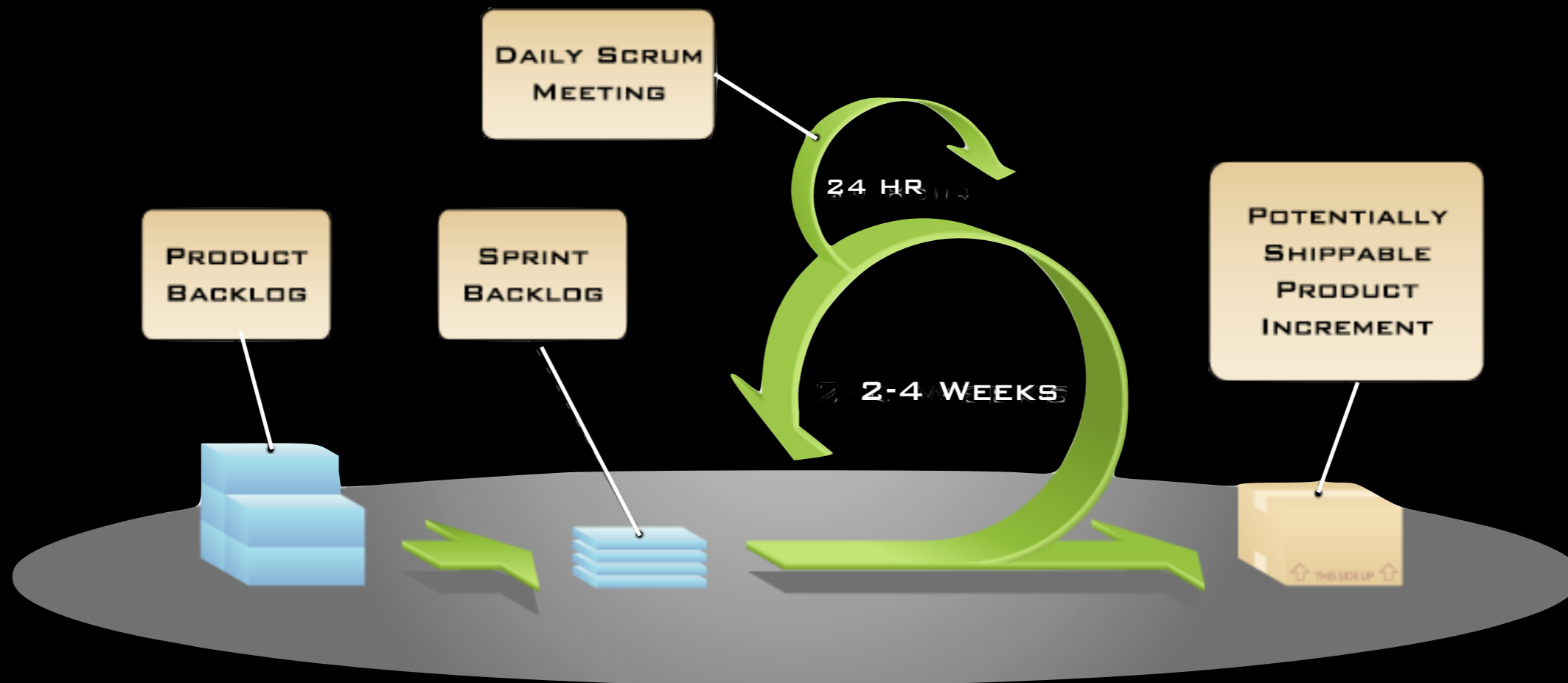
Agile Development with Scrum

What is scrum ?



Fig. 6: The Scrum

The scrum is a pushing contest between two teams of eight players. The ball is fed in from the side by the scrumhalf and the team that drives their opponent backwards and hooks the ball out past the last foot of their own scrum wins possession. A scrum down is used to restart play after certain infractions such as a “knock on” or a forward pass.



ROLES

PRODUCT OWNER
 SCRUM MASTER
 TEAM MEMBER

CEREMONIES

SPRINT PLANNING
 DAILY SCRUM
 SCRUM REVIEW
 SCRUM RETROSPECTIVE

ARTIFACTS

PRODUCT BACKLOG
 SPRINT BACKLOG

Iteration Exit ?

- Exit Check List
- Done, Done, Done
- Stakeholder Demo/Review
- Time Boxed Iteration

What if we can't finish all the content planned for this iteration ?

Team Collaboration

Version Control

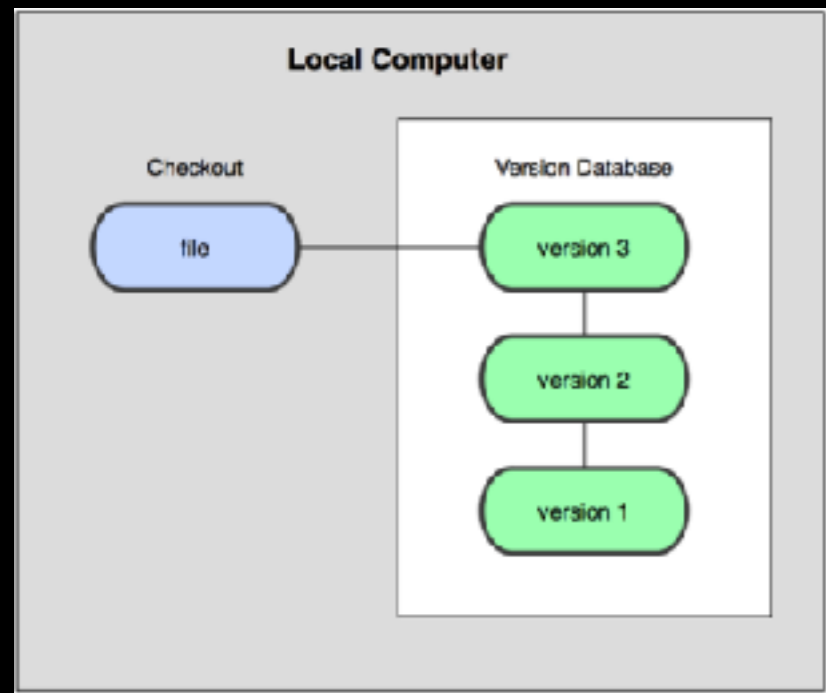
- Why Version Control ?
 - Backup and Restore
 - Source code sharing and synchronization
 - Merges
 - Branches

It is the very first thing you need to start a project

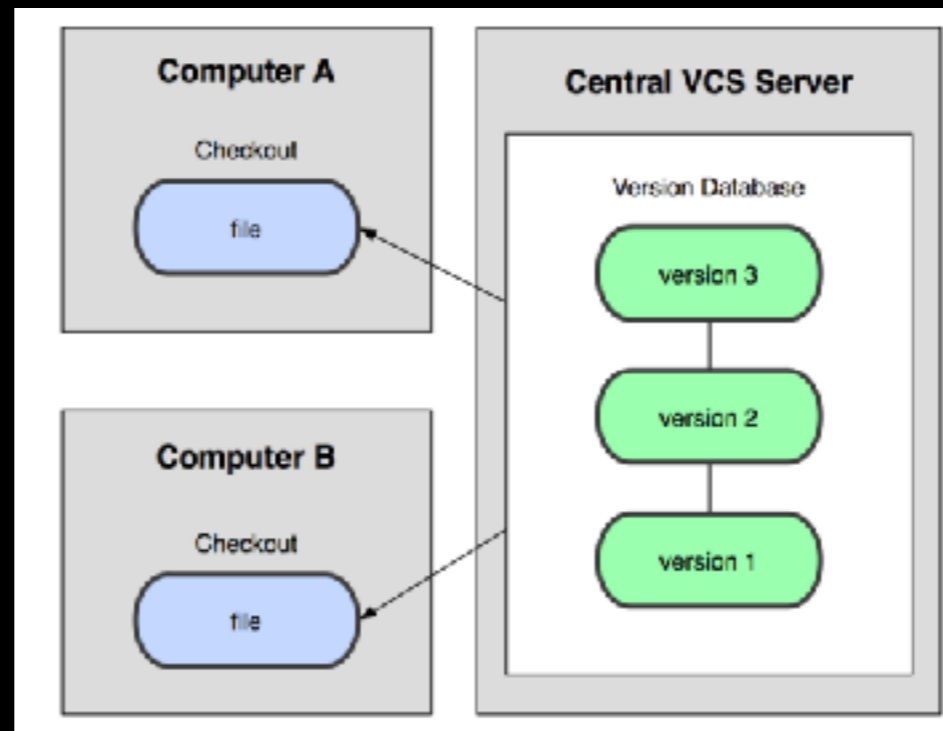
Version Control

- Tools available
 - CVS
 - Subversion
 - GIT
 - Mercurial
 - ClearCase
 - ...

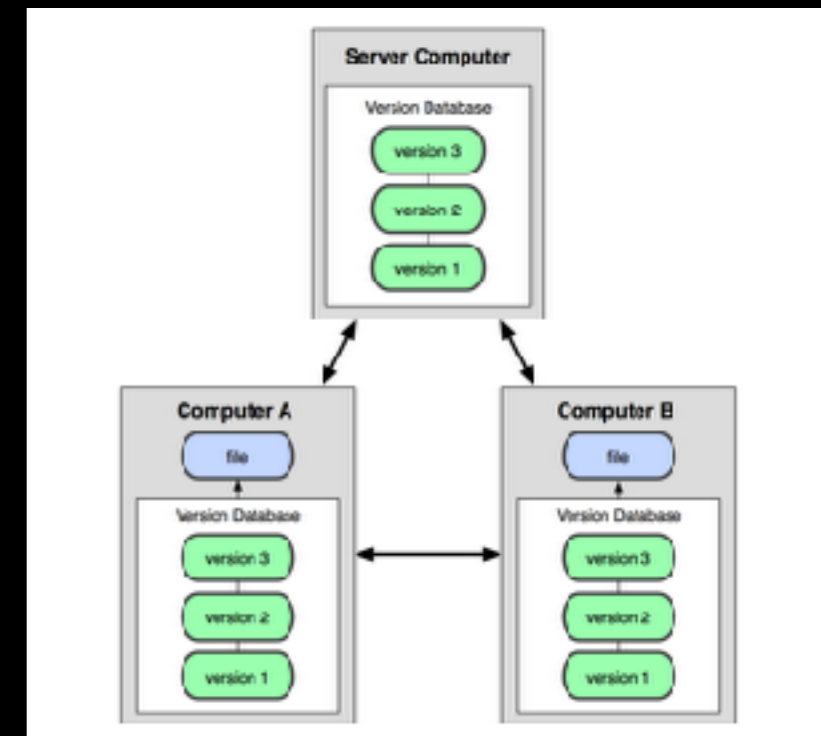
Different Topologies



Local

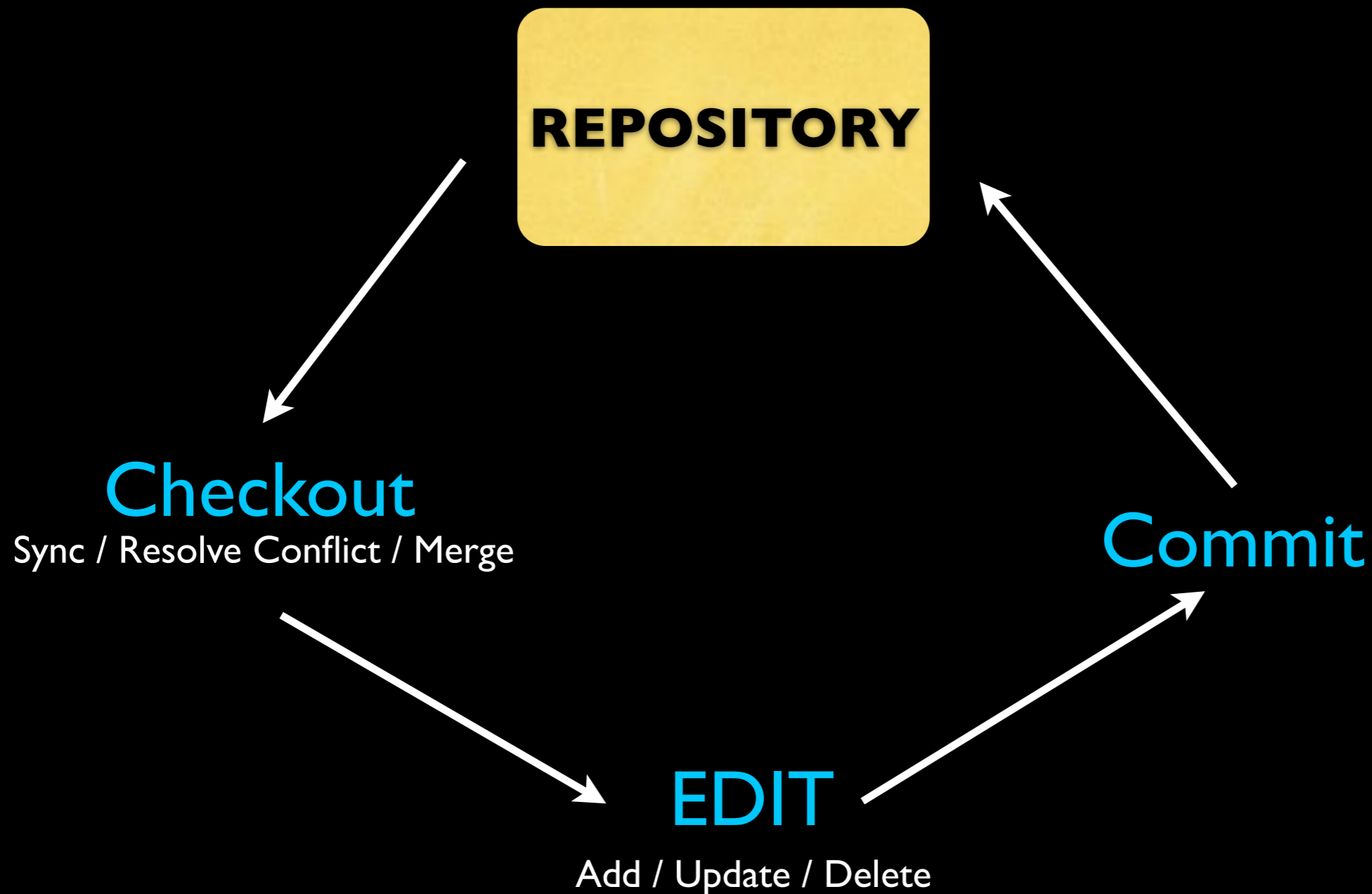


Centralized



Distributed

Common Usage Pattern



Basic Principles

- No build breaks
- Review your changes before submit
- Each submit should only deal with one task
- Make your submit comment clear

Issue Tracking System

- A centralized place to track all the “issues” that need to be followed up
 - Todos
 - Bugs
 - PMR
- The system maintain the life cycle of the issue, and provide the facilities for team members to collaborate on these issues

Issue tracking with Kanban

The screenshot displays a GitHub repository page for 'ZenHubHQ / ZenHubHQ'. The interface is set to 'Boards' view, showing a Kanban board with six columns: 'New Issues', 'Icebox', 'Backlog', 'To Do', 'In Progress', and 'For review'. Each column contains a list of issues, each with a title, description, and various labels (e.g., 'Discussion', 'Bug', 'Engineering', 'Feature', 'Help Wanted', 'Ready for QA'). The issues are organized into 'Epics' and 'Sprints'. The top navigation bar includes options for 'Code', 'Issues (128)', 'Pull requests (34)', 'Boards', 'Burndown', 'Projects (0)', and 'Wiki'. The right sidebar shows repository statistics: 'Unwatch (05)', 'Star (34)', and 'Fork (0)'. A search bar and a 'New Issue' button are also visible.

Continuous Integration

Life without CI ...

- Hard to pinpoint the root cause of failures
- Depending on project natures, it might take significant effort for integration
- It increase the testing efforts
- Low release quality

RTC Build History

Work Items - 20110928-0332 - Rational Team Concert

File Edit Navigate Search Project Run Window Help

Team Team Project My Work Team

All Project and Team Areas (11 of 17 areas selected)

- 0.5.3 build
- 0.5.4 build
- 0.5.5 build
- 0.5.6 build
- 0.5.7 build
- 2.0.0 build
- 3.0.0 build - MCP6 express - 9004
- 3.0.0 build - MCP6 express - 9005
- 3.0.0 build - MCP6 with the works 9004
- 3.0.0 build - MCP6 with the works 9005
- EVT only
- Trunk Integration MCP6 build express - 9004
- Trunk Integration MCP6 build express - 9005
- Trunk Integration MCP6 build express without protected-sr
- Trunk Integration MCP6 build with the works - 9004
- Trunk Integration MCP6 build with the works - 9005
- Trunk Integration MCP7 build express - 9004
- Trunk Integration MCP7 build express - 9005
- Trunk Integration MCP7 build express - blade
- Trunk Integration MCP7 build express without protected-sr
- Trunk Integration MCP7 build with the works - 9004

Build Trunk Integration MCP7 build express - 9005 20110928 0332

Completed

Duration: 1 hour, 30 minutes, 51 seconds
 Start Time: September 28, 2011 3:32:17 PM
 Completed: September 28, 2011 5:03:08 PM

Status Trend:

Contribution Summary

- Changes: [Show changes](#)
- Downloads: [19 downloads](#)
- Logs: [7 logs](#)
- Repository Workspaces: [Trunk Integration MCP7 express 9005 build workspace](#)
- Snapshot: [Trunk Integration MCP7 build express - 9005_20110928-0332](#)
- Tests: [293 tests, 0 failures, 0 errors](#)
- Work items: [1 included in build](#)

Reported Work Items

Work items reported against this build to help stabilize it

- None reported against this build
- [Create a new work item](#)
- [Associate an existing work item](#)

General Information

- Requested by: (scheduled build)
- Build Definition: [Trunk Integration MCP7 build express](#)
- Build Engine: [build2](#)
- Build History: [33 builds](#)
- Tags:
- Deletion allowed

Overview Activities Tests Downloads Logs Properties

Work Items Team Cloud Problems Team Advisor Change Explorer Pending Changes Builds History Console Repository Files Search Properties

Trunk Integration MCP7 build express - 9005 - Found 33 Builds (8093 ms)

Build	Label	Progress	Estimated Completion	Start Time	Duration
Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU)	20110928-0629	4% (Pre-build setup)	in 1 hour and 17 minu...	September 28, 2011 6:29:40 PM	23 seconds
Trunk Integration MCP7 build express - 9005 (personal build by Robert D. Callaway)	20110928-0628	8% (Fetching files)	in 1 hour and 16 minu...	September 28, 2011 6:28:52 PM	1 minute, 11 sec.
Trunk Integration MCP7 build express - 9005	20110928-0332	Completed		September 28, 2011 3:32:17 PM	1 hour, 30 minute
Trunk Integration MCP7 build express - 9005 (personal build by Robert D. Callaway)	20110928-0144	Completed		September 28, 2011 1:44:02 PM	1 hour, 21 minute
Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU)	20110928-0015	Completed		September 28, 2011 12:16:06 PM	1 hour, 29 minute

Search for ID or Text Bedrock Hub

<No Current Work>

Build Failed

Work Items - 20110927-2042 - Rational Team Concert

File Edit Navigate Search Project Run Window Help

Team Team Project My Wo Team

All Project and Team Areas (11 of 12 areas selected)

- 0.5.3 build
- 0.5.4 build
- 0.5.5 build
- 0.5.6 build
- 0.5.7 build
- 2.0.0 build
- 3.0.0 build - MCP6 express - 9004
- 3.0.0 build - MCP6 express - 9005
- 3.0.0 build - MCP6 with the works 9004
- 3.0.0 build - MCP6 with the works 9005
- DVT only
- Trunk Integration MCP6 build express - 9004
- Trunk Integration MCP6 build express - 9005
- Trunk Integration MCP6 build express without protected-sr
- Trunk Integration MCP6 build with the works - 9004
- Trunk Integration MCP6 build with the works - 9005
- Trunk Integration MCP7 build express - 9004
- Trunk Integration MCP7 build express - 9005
- Trunk Integration MCP7 build express - Blade
- Trunk Integration MCP7 build express without protected-sr
- Trunk Integration MCP7 build with the works - 9004
- Trunk Integration MCP7 build with the works - 9005
- VM builder - Trunk Integration MCP7 build with the works -

Enterprise Extensions

Plans

Build Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU) 20110927-2042

Completed

Duration: 1 hour, 29 minutes, 44 seconds
Start Time: September 28, 2011 8:42:22 AM
Completed: September 28, 2011 10:12:07 AM

Status Trend:

Contribution Summary

Downloads: [19 downloads](#)
Logs: [7 logs](#)
Repository Workspace: [Trunk Integration Workspace](#)
Tests: [293 tests, 10 failures, 0 errors](#)

General Information

Requested by: CLEMENT SU
Build Definition: [Trunk Integration MCP7 build express - 9005](#)
Build Engine: [build3](#)
Build History: [31 builds](#)
Tags:
 Deletion allowed

Reported Work Items

Work items reported against this build to help stabilize it.

- None reported against this build
- [Create a new work item](#)
- [Associate an existing work item](#)

Overview Activities Tests Downloads Logs Properties

Work Items Tag Cloud Problems Team Advisor Change Explorer Pending Changes Builds History Console Repository Files Search Properties

Trunk Integration MCP7 build express - 9005 - Found 33 Builds (8093 ms)

Build	Label	Progress	Estimated Completion	Start Time	Duration
Trunk Integration MCP7 build express - 9005 (personal build by Jeannie K. Hawrysz)	20110927-2114	Completed		September 28, 2011 9:14:31 AM	1 hour, 34 minutes, 5...
Trunk Integration MCP7 build express - 9005 (personal build by Jeannie K. Hawrysz)	20110927-2013	Completed		September 28, 2011 8:13:55 AM	1 hour, 35 minutes, 3...
Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU)	20110927-2042	Completed		September 28, 2011 8:42:22 AM	1 hour, 29 minutes, 4...

Search for ID or Text Bedrock Hub

<No Current Work>

Failed Test Cases

Build Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU) 20110927-2042

JUnit Tests

Name	Tests	Failures	Errors	Time Taken	Run ...
FVT-onbox-JUnit-remanufacture	245	10	0	23 m 44 s	
com.ibm.bedrock.fvt.suites.BedrockFvtFilteredTestSuite	245	10	0	23 m 44 s	
com.ibm.bedrock.fvt.LicenseAcceptanceCliTests	6	2	0	24 s	
testLicenseRejectSSH6	1	1	0	11 ms	5
testLicenseAcceptSSH6	1	1	0	2 ms	6
com.ibm.bedrock.fvt.FileGetPutCliTests	36	8	0	3 m 17 s	
testGetFileSCP6	1	1	0	2 ms	14

Details

Class name:

Method:

Time taken:

Overview Activities Tests Downloads Logs Properties

Build Logs

The image shows a screenshot of a build system interface. On the left, there is a file explorer window titled "Build Trunk Integration MCP7 build express 9005 (personal build by CLEMENT SU) 20110927-2042". It displays a tree view of log files under categories like "Build" and "Test". The selected file is "build-1317170540945.log".

On the right, a log viewer window displays the content of the selected log file. The log text is as follows:

```
2011-09-27 20:43:21 [Jazz build engine] running on host: bedrock.rtp.raleigh.ibm.com
2011-09-27 20:43:21 [Jazz build engine] Should build occur?
2011-09-27 20:43:21 [Jazz build engine] Yes: Always build a user initiated request.
2011-09-27 20:43:23 [Jazz build engine] Invoking ggc-build participant "com.ibm.team.build.jazzcom"
2011-09-27 20:43:27 [Jazz build engine] Deleting fetch destination "/home/build3/jazz/buildsystem/buildengine/c
2011-09-27 20:43:44 [Jazz build engine] Fetching files to fetch destination "/home/build3/jazz/buildsystem/bui
2011-09-27 20:43:02 [Jazz build engine] Invoking build participant "com.ibm.team.build.ant"
Buildfile: /home/build3/jazz/buildsystem/buildengine/eclipse/workspace/src/src-build.xml
[echo] hv1.pxeFirmwareFilename: build3.tar.gz

buildall:
[echo] hv1.pxeFirmwareFilename: build3.tar.gz

setup:
[echo] SDK version: 3.9.7.0
[echo] buildDefinitionId: Trunk Integration MCP7 build express - 9005
[echo] Personal build: [no]
[echo] buildLabel/RICEBUILDID: 20110927-2042
[echo] buildResultUUID: _review0lqEeC6LpMKdz5Pgw
[echo] build uuid: build3
[echo] BRDEVHOME: /home/build3/jazz/buildsystem/buildengine/eclipse/workspace
[echo] BRHOME: /home/build3/bedrock-adt
[echo] MCP_CACHE_DIR: /home/mcp-cache-dir
[echo] JAVA_HOME (OR if unset): [unset]
[echo] mcp.cnv: mcp7
[echo] mcp64.env: mcp7_64
[echo] Ant version: Apache Ant version 1.7.1 compiled on June 27 2008
[echo] build cache hostname: bedrock.rtp.raleigh.ibm.com
```

Modern Continuous Integrations Tools



TRAVIS



Jenkins



circleci

Put it all together

Branch build flow



You push your
code to GitHub



GitHub triggers
Travis CI to build



Hooray!
Your build passes!



Travis CI deploys
to Heroku



Travis CI tells the
team all is well

Summary

- Before You Start your project
 - Decide the development process that works for your team
 - Identify the tools to use for team collaboration
 - Version Control, Issue Tracking, Information Sharing, Todo...
 - Identify your build tools, unit testing framework, and setup your continuous integration system.
 - Setup the development disciplines

Questions



Reference

scrum in 10 min

<https://www.youtube.com/watch?v=XU0IIRItyFM>

Spotify Engineering Culture

<https://labs.spotify.com/2014/03/27/spotify-engineering-culture-part-1/>