

Software Development Practices

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Software Development is about ...

Critical factors of Software Delivery

Project
Management

Team Collaboration

Continuous
Integration

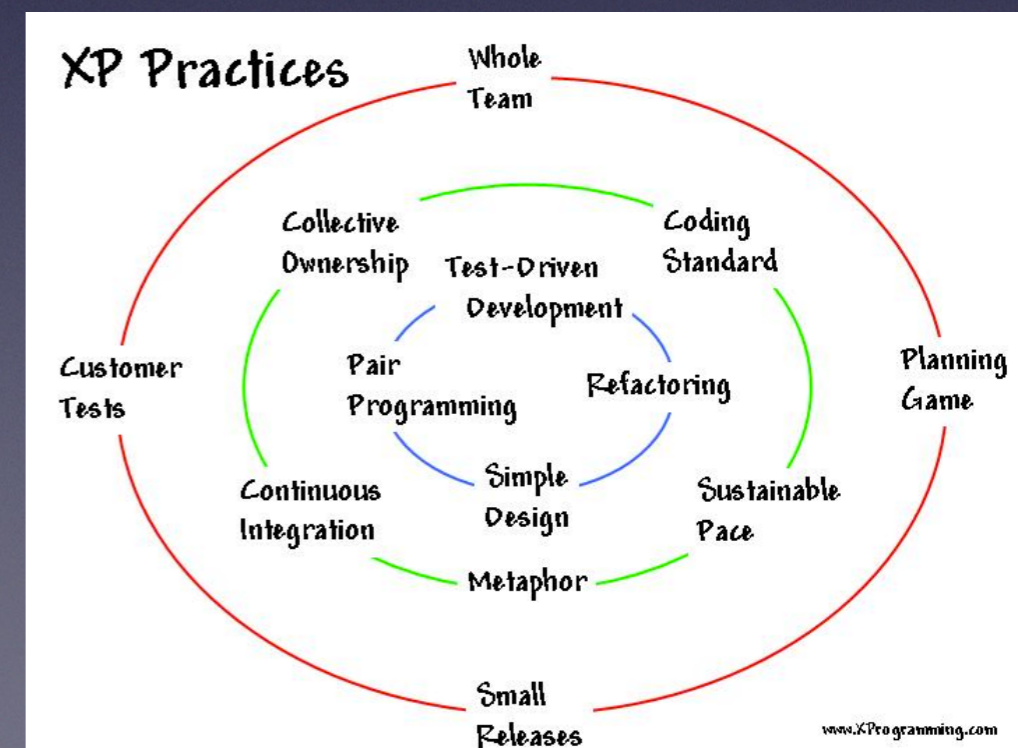
Issue Tracking

Agenda

- Part 1 : Agile Development Process
- Part 2 : Team Collaboration
- Part 3 : Continuous Integration
- Part 4 : IBM Experience

What I won't cover in this session

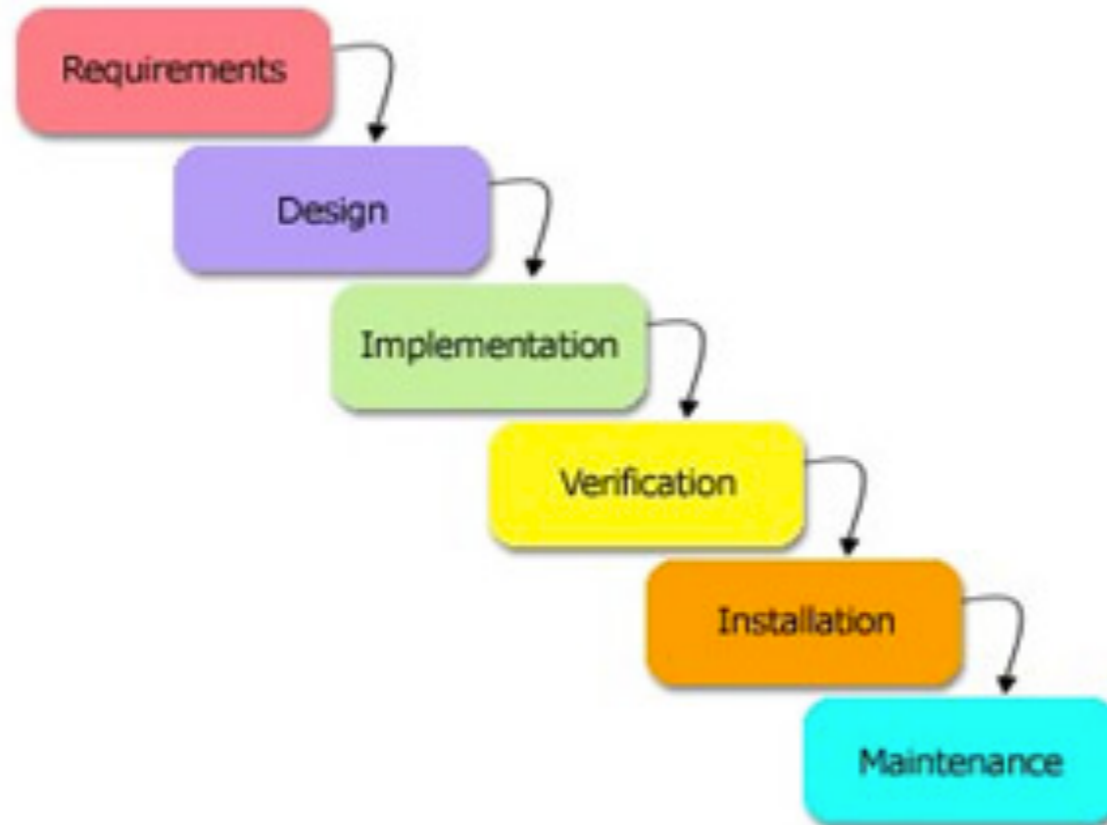
- Pair Programming
- Test-Driven Development
- Refactoring
- ...



Agile Development Process

What is Agile ?

What is the problem of waterfall development process



- Risk
- Cost
- **Satisfaction**

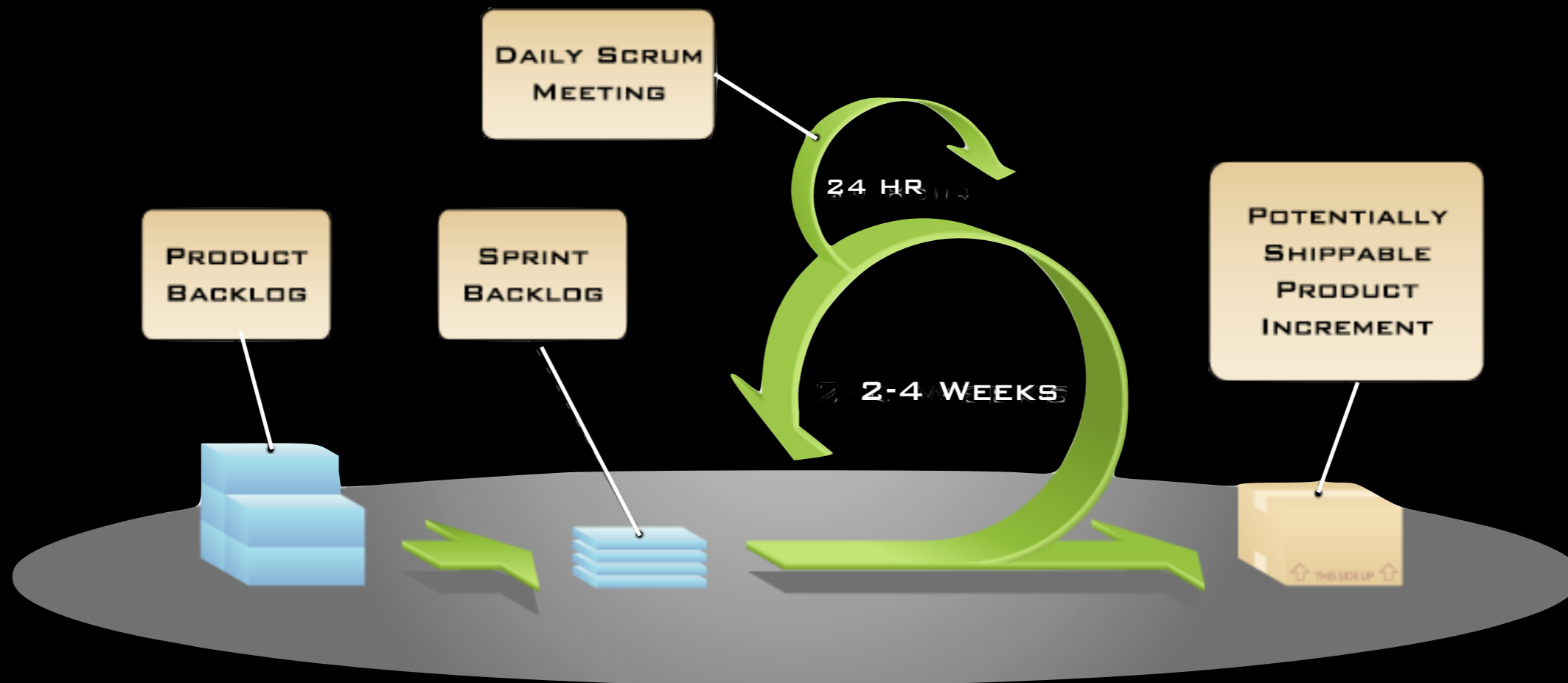
When to use waterfall development process ?

- 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
- 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



ROLES

PRODUCT OWNER

SCRUM MASTER

TEAM MEMBER

CEREMONIES

SPRINT PLANNING

SPRINT REVIEW

SPRINT RETROSPECTIVE

DAILY SCRUM

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

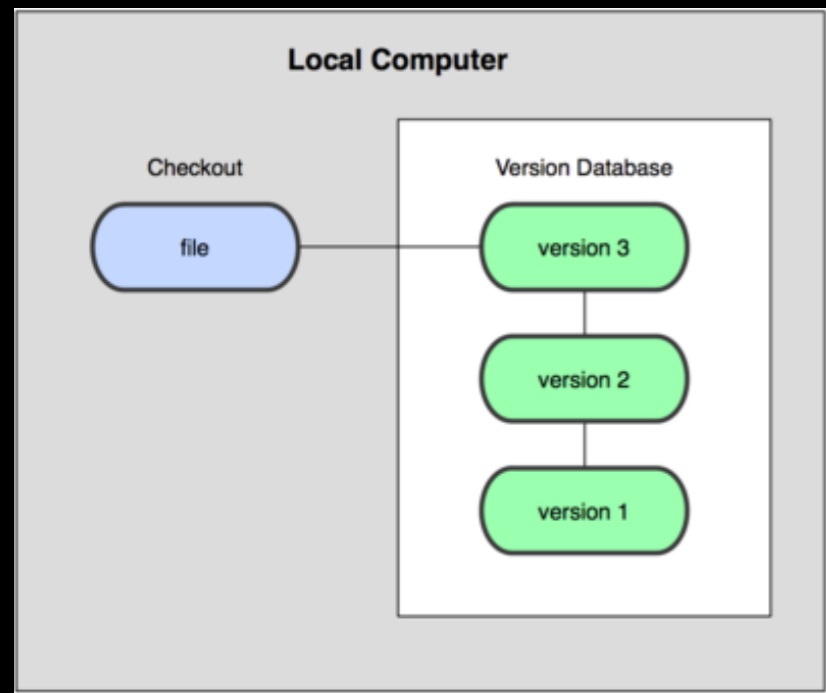
- Why Version Control ?
 - Backup and Restore
 - Source code sharing and synchronization
 - Merges
 - Branches

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

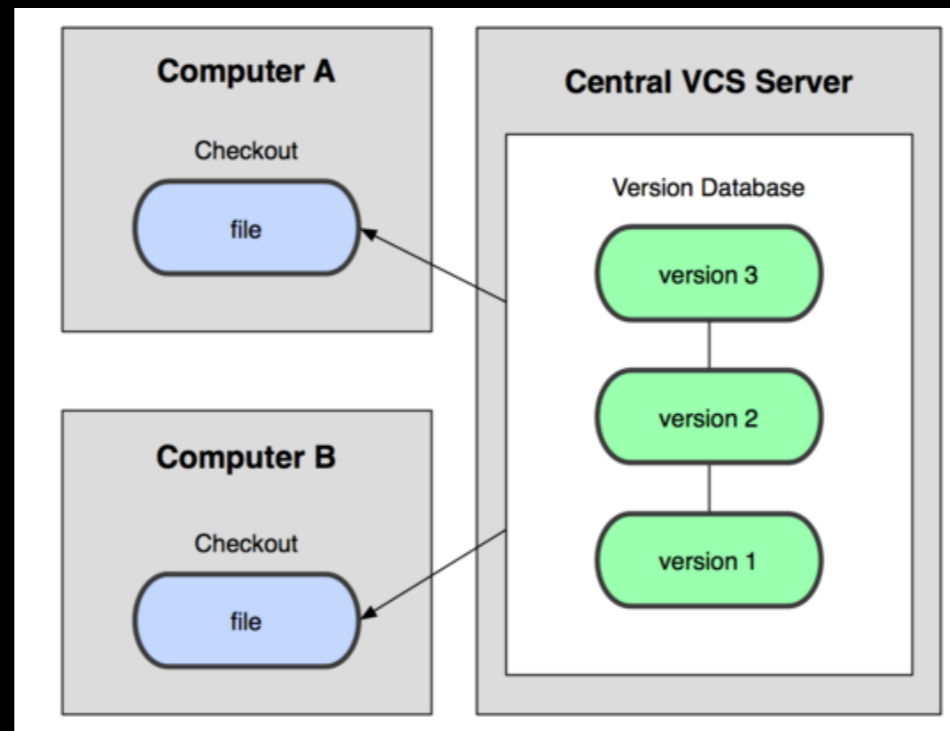
Version Control

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

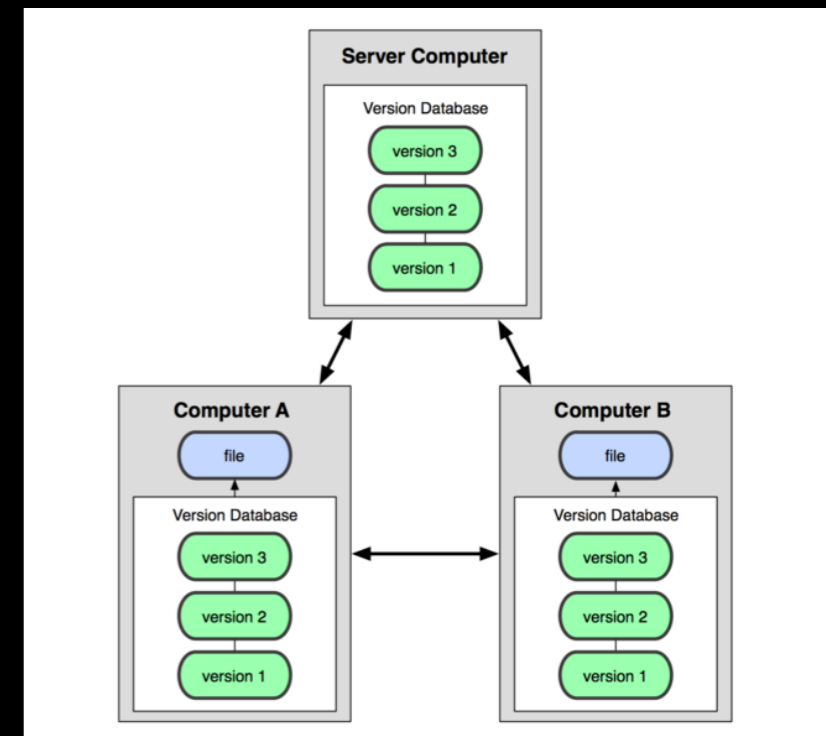
Different Topologies



Local

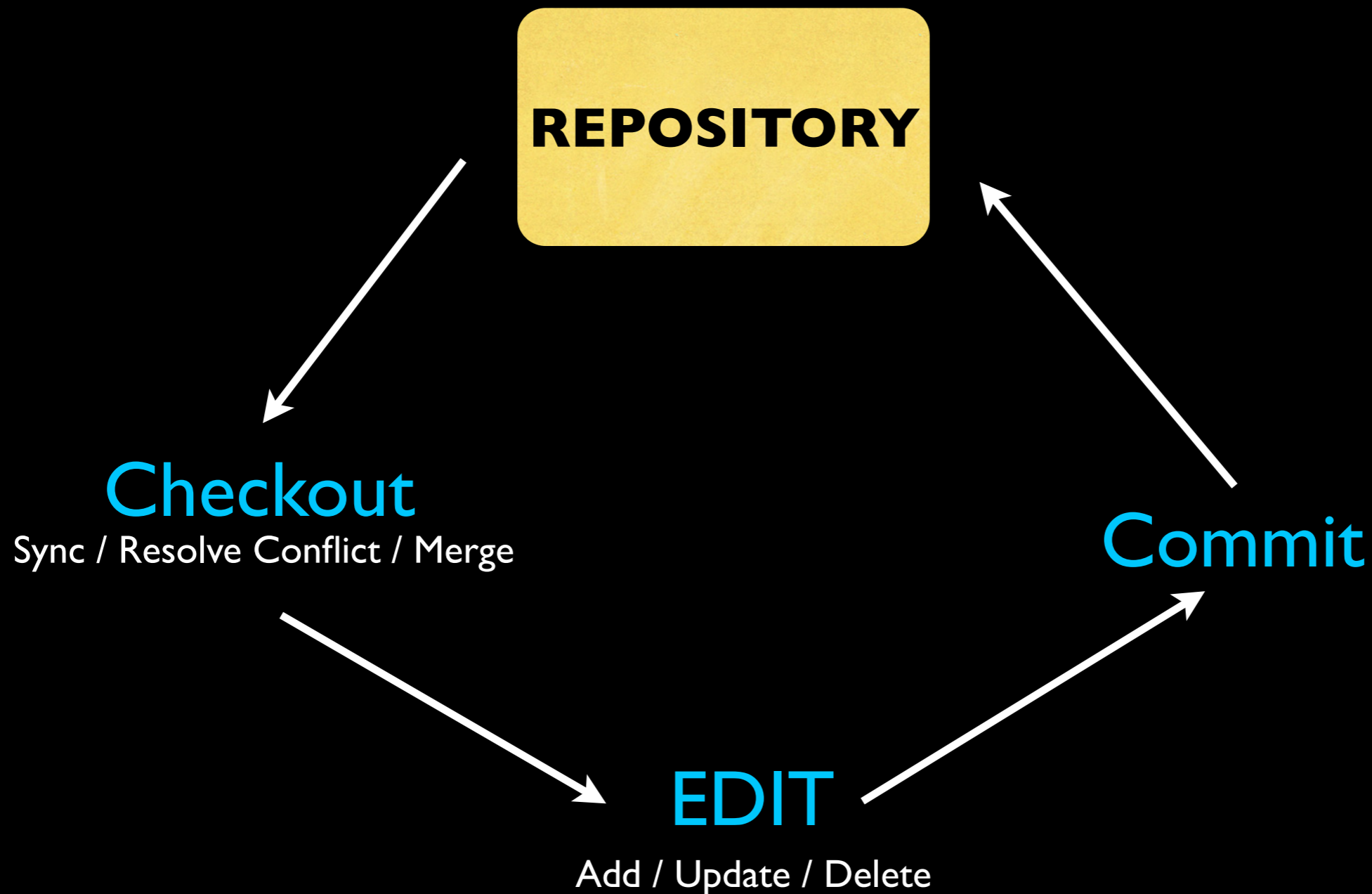


Centralized

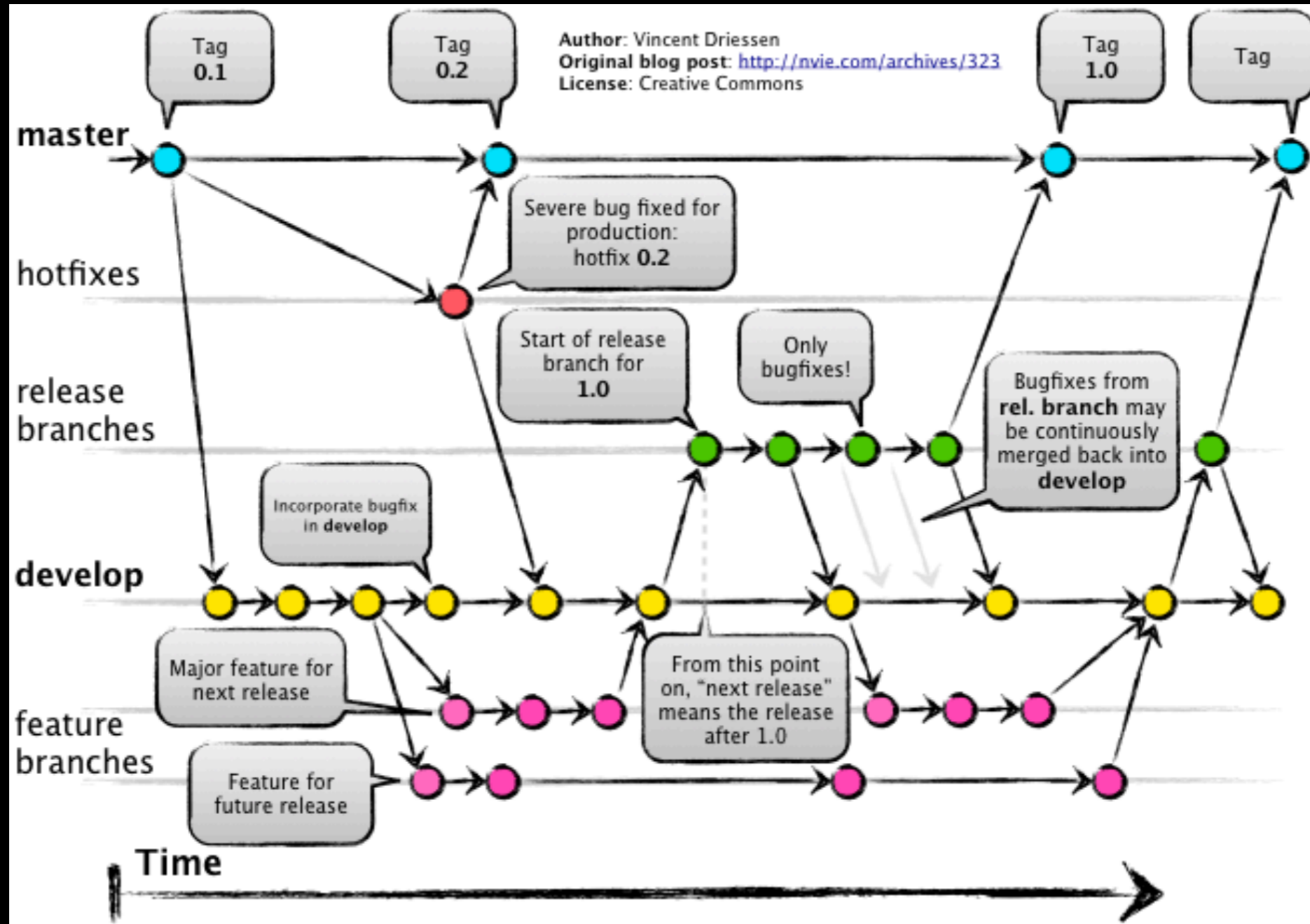


Distributed

Common Usage Pattern



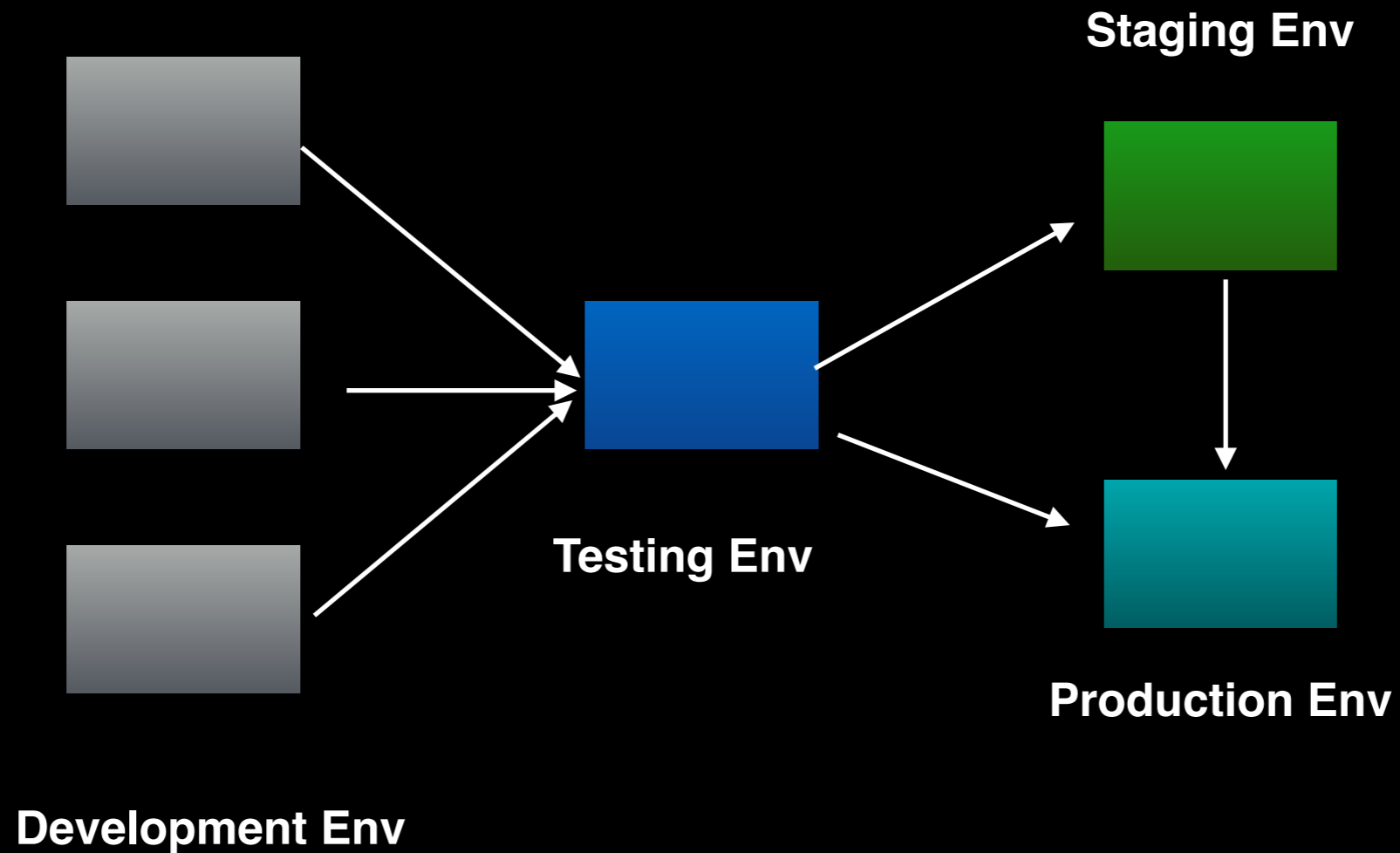
Git Flow Best Practices



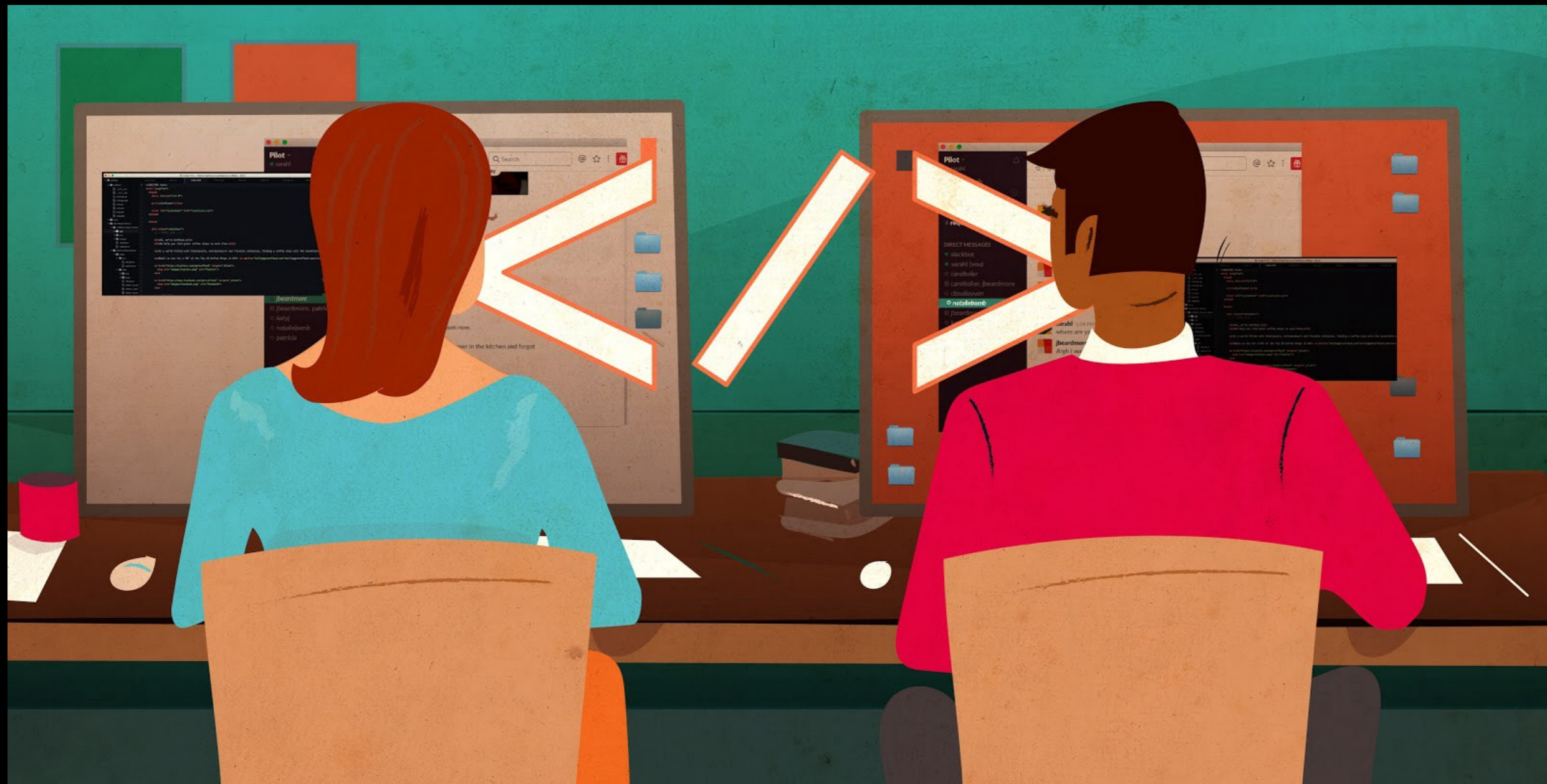
Basic Principles

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

Environment Practices



Communication



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 GIT

axiomzen / routific PRIVATE

Watch 28 Star 0 Fork 0

Repositories (1/1) show all Labels Milestones Assignees View pull requests View closed issues New Issue

New Issues (9)

- routific #21: Update social media tag styling (Engineering, Feature, Help Wanted, Invalid)
- routific #27: Real-time schedule updates (Help Wanted)
- routific #20: Feature request: Auto Discounting (Discussion, Feature)
- routific #1: Loading Testing API (Enhancement, Help Wanted, Question)
- routific #12: First Demo (Duplicate, Enhancement)
- routific #13: Demo Video

Backlog (8)

- routific #7: Beta Testing Feedback (Bug, Discussion, Duplicate, Feature, Help Wanted)
- routific #28: Partner with GreenPlanet Conference (Discussion, Help Wanted)
- routific #22: SMS delivery updates (Duplicate, Question)
- routific #19: Miles / Km Popup (Engineering, Wont Fix)
- routific #15: Increase geocoding speed (Feature)

To Do (4)

- routific #24: Reset password page fix (Engineering, Enhancement)
- routific #17: Better handling of route dispatch (Duplicate)
- routific #16: Feature request: Instant driver feedback (Discussion, Enhancement)
- routific #23: Real-time traffic data in maps (Enhancement)

In Progress (3)

- routific #25: Weekly analytics newsletter (Invalid, Question)
- routific #18: Improve SMS dispatch system (Enhancement, Invalid)
- routific #8: Mobile Screen View (Engineering, Help Wanted, Invalid)

Done (1)

- routific #6: Map Load (Help Wanted)

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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 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
- BVT 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 Workspace: [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 i
 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 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 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 secc
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 1:44:52 PM	1 hour, 21 minute
Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU)	20110928-0016	Completed		September 28, 2011 12:16:06 PM	1 hour, 29 minute

Search for ID or Text Bedrock Hub

<No Current Work>

Build Failed

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: [34 builds](#)
Tags:
 Deletion allowed

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)	20110927-2043	Completed		September 28, 2011 8:43:55 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...

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. The top window displays the build configuration: "Build Trunk Integration MCP7 build express - 9005 (personal build by CLEMENT SU) 20110927-2042". Below this is a "Log Files" section with a table listing various log files.

File Name	Description	File Size
Build		
compile-3.9.7.0-mcp7-REL-20110927-2042.log	...Compiling log	
virtual-20110927-2042.log	...Virtual image	
Test		
beam-20110927-2042.log	Performing BEA	
bvtRun-20110927-2042.log	BVT Client serial	
smoketest-prepped-REL-20110927-2042.log	...Smoke test	
unittest-3.9.7.0-mcp7-REL-20110927-2042.log	...Running unit	
<no component>		
build-1317170540945.log	Full Build Log	

The bottom window shows the content of the selected log file, "build-1317170540945.log". The log output is as follows:

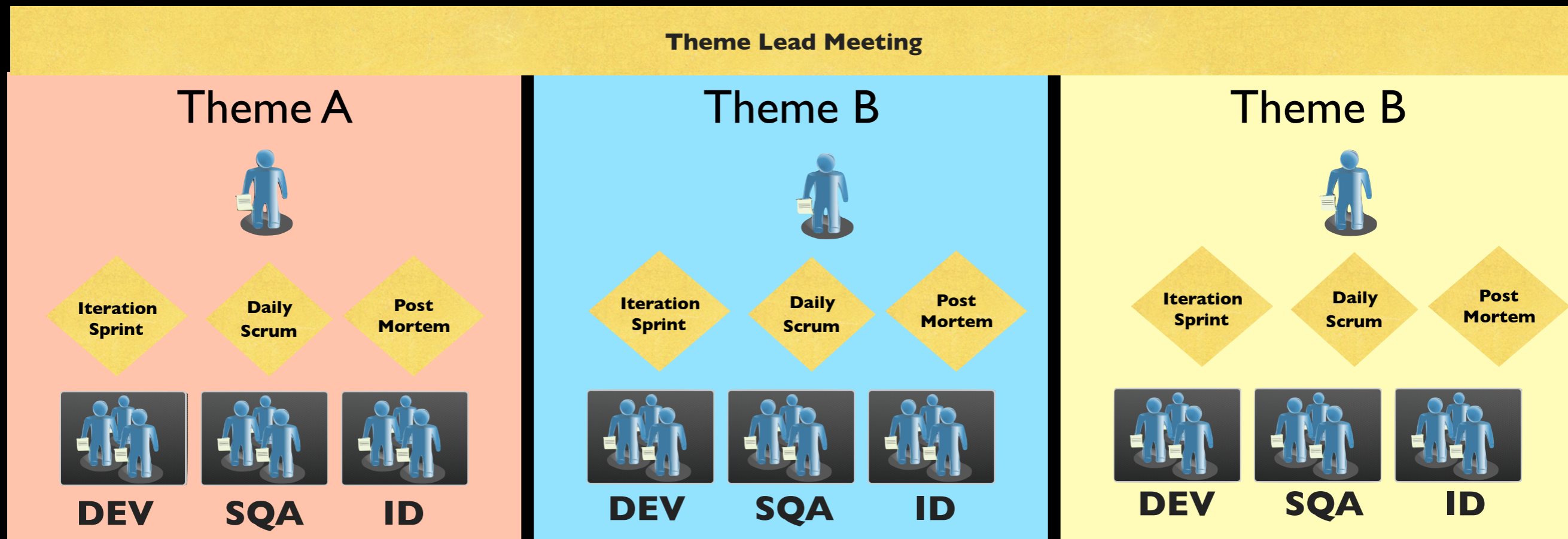
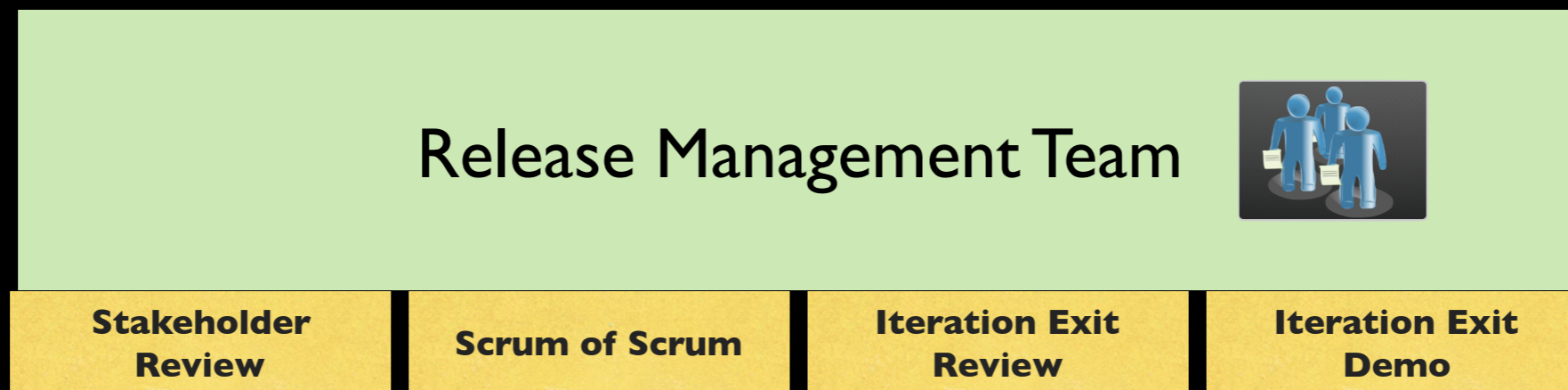
```
2011-09-27 20:42:21 [Jazz build engine] running on host: bedrock.rtp.raleigh.ibm.com
2011-09-27 20:42:21 [Jazz build engine] Should build occur?
2011-09-27 20:42:21 [Jazz build engine] Yes: Always build a user initiated request.
2011-09-27 20:42:23 [Jazz build engine] Invoking pre-build participant "com.ibm.team.build.jazzscm"
2011-09-27 20:42:27 [Jazz build engine] Deleting fetch destination "/home/build3/jazz/buildsystem/buildengine/e
2011-09-27 20:42:44 [Jazz build engine] Fetching files to fetch destination "/home/build3/jazz/buildsystem/bui
2011-09-27 20:45:02 [Jazz build engine] Invoking build participant "com.ibm.team.build.ant"
Buildfile: /home/build3/jazz/buildsystem/buildengine/eclipse/workspace/src/rtc-build.xml
[echo] bvt.pxFirmwareFilename: build3.tar.gz

buildall:
[echo] bvt.pxFirmwareFilename: 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/RTCBUILDID: 20110927-2042
[echo] buildResultUUID: _revswOlqEeC8LpMKdz5PgW
[echo] build userid: build3
[echo] BRDEVHOME: /home/build3/jazz/buildsystem/buildengine/eclipse/workspace
[echo] BRHOME: /home/build3/bedrock-sdk
[echo] MCP_CACHE_DIR: /home/mcp-cache-dir
[echo] JAVA_HOME (OK if unset): [unset]
[echo] mcp.env: 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
```

IBM Experience

Role and Responsibilities



Software Engineering For AI Software Development

Why are AI Programs Different?

- Content: Models not programs
- Process: Training not debugging
- Release: Retraining not patching
- Uncertainty: of objective
- Uncertainty: of action/recommendation
- Uncertainty: propagates through model

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

