Git – Quick Overview

- Git – Quick Start
- Building Your First Repository
- Working in a Team
- Advanced Features

Basics of version control

- Keeping history of working versions of your projects
- know who made changes as well as when and why
- Merge Conflicting changes

How Git approaches version control

- Each commit is a snapshot of entire project not just the changes made
- Developers works on clones of the repository with complete access to history

Advantages of distributed version control

- Multiple clones means multiple backups
- Ability to work offline
- Setup multiple independent workstation

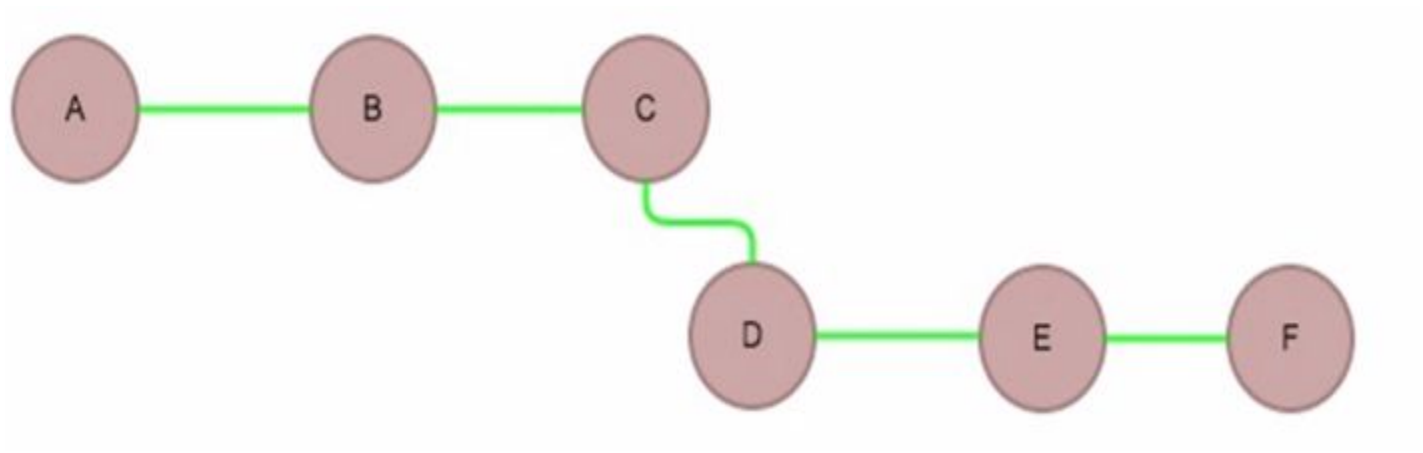
Choosing Workflow

- Centralized Workflow
- Feature branch workflow
- Forking workflow

Centralized Workflow

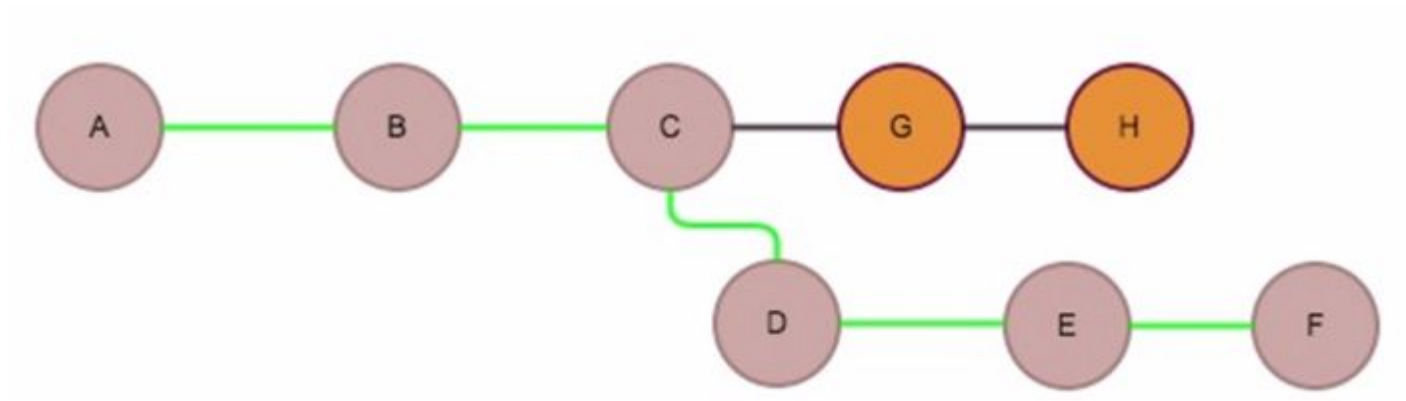
- It is similar to CVCS repository
- Team members all work off a single branch in a central repository
- Rebase unpushed commits on top of updates to the master branch
- Requires frequent synchronization on larger team
- It is suitable for smaller team but in larger team it required frequent synchronization to keep divergence manageable

Tom’s Local Branch



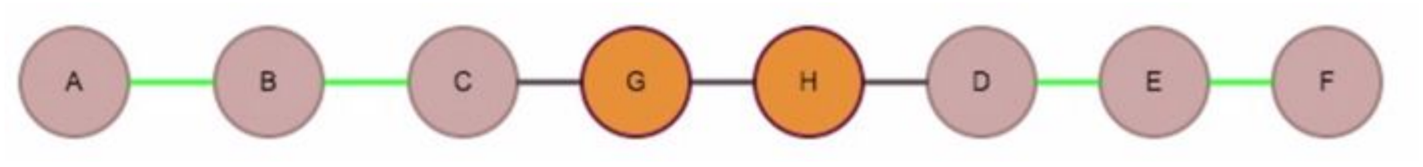
Tom’s Diverged Branch

Branch get diverged cause of bob’s commit



Tom’s Rebased Branch

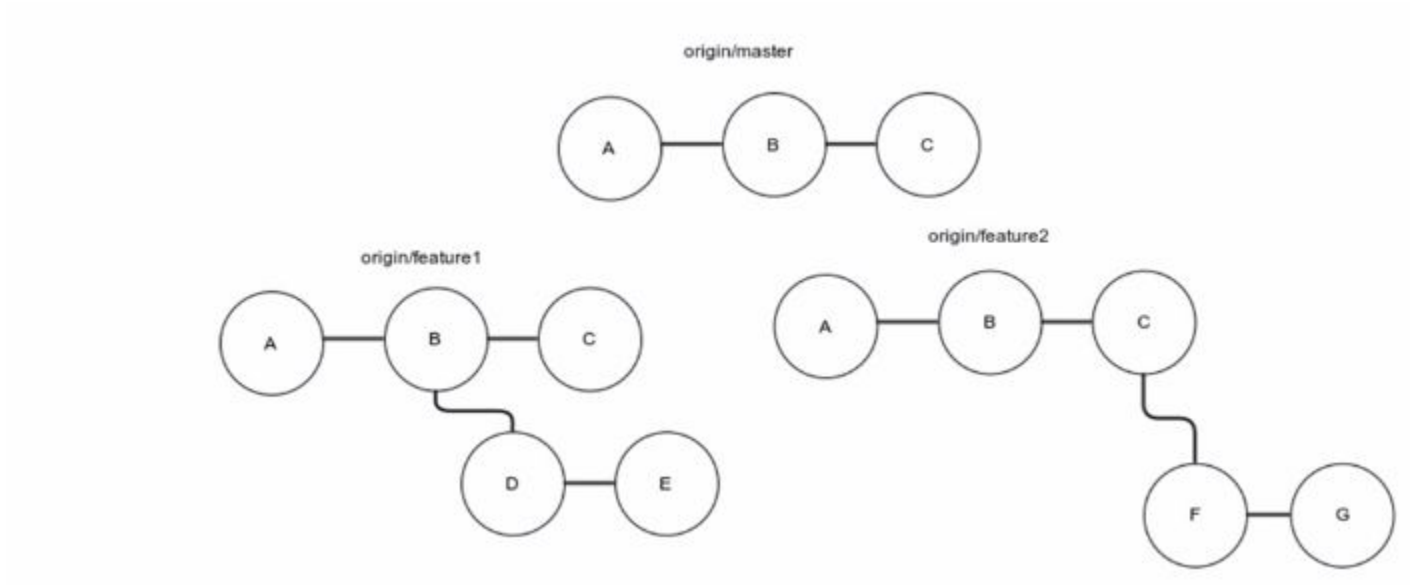
Tom needs to incorporate Bob’s changes



Feature Branch Workflow

- Feature developed in dedicated branches
- Issue pull request from feature branch to master
- Keep main code base clean and working during development

Feature Branch Workflow



Forking Workflow

- Each developer has dedicated online repository
- Write access is restricted to administrators
- Pull request are issued to main repository
- Every fork has information about its master branch
- It can track divergence between different repositories
- In this type of workflow the write-access is restricted to the maintainers only
- Here developers push commits to their own forks and make pull requests to the central repository
- Admin view these changes and decides if the changes can be merged

Workflow Summary

Different team dynamics requires different collaboration techniques. Choose the workflow that suits your group.

- Choose the familiarity of a centralized workflow while capitalizing on Git's additional advantages
- Create feature branches to keep new development from interfering with the stable code base
- Use the open source forking model to allow collaborators from anywhere while keeping your main repo protected

Building Your First Repository

- Repository Initialization
- Making your first commit
- Managing remotes
- Viewing commit history

Initialization

It is important to maintain logs:

- Initializing a local repository
- Tracing new files
- Example
  - Let meet a friend tom who has an idea for app
  - To starts developing his idea into reality with his programming skills
  - He takes the support of open source community for this purpose

Initialization (Commands)

1. yum install git
2. mkdir -p /opt/gitdemo
3. cd /opt/gitdemo
4. git init
5. ls -a
6. vim problem_solver.rb
7. git status
8. git add problem_solver.rb
9. git status

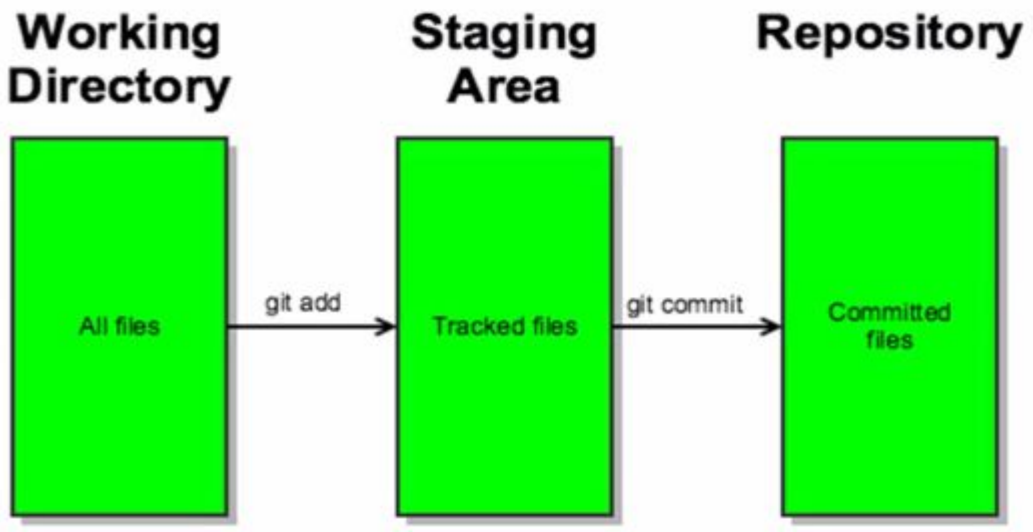
The First Commit

- Make changes in working directory
- Move changes to staging area
- Commit the changes to the repository
- README.md
    - What it does exactly
    - System requirements
    - Installation and running instructions
    - How to contribute to the project
    - md stands for **markdown** which is a simple syntax for providing semantic information and representing common formatting in plain text
- .gitignore is a hidden file which lists the files to ignored while commiting

The First Commit (Commands)

1. vim problem_solver.rb
   I. class Problem Solver
   II. def solve_easy_problem
   III. end
   IV. end
2. vim README.md
   I. Install Ruby
3. Vim .gitignore
   I. *.swp
4. gt status
5. git diff problem_solver.rb
6. git config --global user.mail “mahesh.s.kharwadkar@gmail.com”
7. git config –global user.name “maheshkharwadkar”
8. git add .
9. git commit -m "first commit"

The First Commit



The First Commit (Commands)

1. vim problem_solver.rb
   I. class Problem Solver
   II. def solve_easy_problem
   III. end
   IV. def solve_hard_problem
   V. end
   VI. end
2. git add .
3. git diff
4. vim problem_solver.rb
   I. class Problem Solver
   II. def solve_easy_problem
   III. end
   IV. def solve_hard_problem
   V. end
   VI. def solve_tougher_problem
   VII. end
   VIII. end
5. git diff **HEAD**
6. git diff

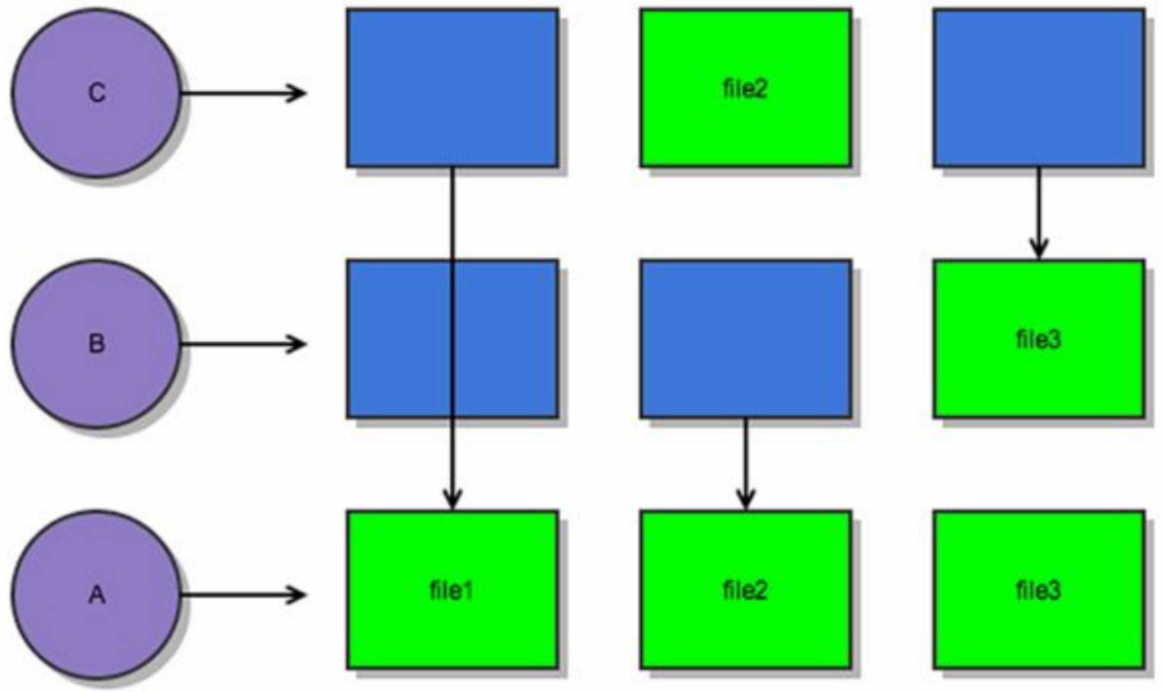
Managing the Remotes

Ethan's
TRAINING | RECRUITMENT | CONSULTANCY

- What a Remote is
  - A copy of your repository hosted online
  - Makes your repository available for collaboration
  - E.g. Github, Bitbucket,beanstalk and codebase
- Adding a remote and pushing changes
  - Create your repository in github.com
  1. git remote add origin https://github.com/maheshkharwadkar/gitdemo.git
  2. git remote
  3. git push origin master
- Authentication options
  1. ssh-keygen -t rsa -C "mahesh.s.kharwadkar@gmail.com"
  2. cat ~/.ssh/id_rsa.pub
  3. copy ssh key to git hub -> settings -> New SSH key
  4. git remote set-url origin git@github.com:maheshkharwadkar/gitdemo.git
  5. touch new_file.txt
  6. git add new_file.txt
  7. git commit -m “new blank file”
  8. git push origin master

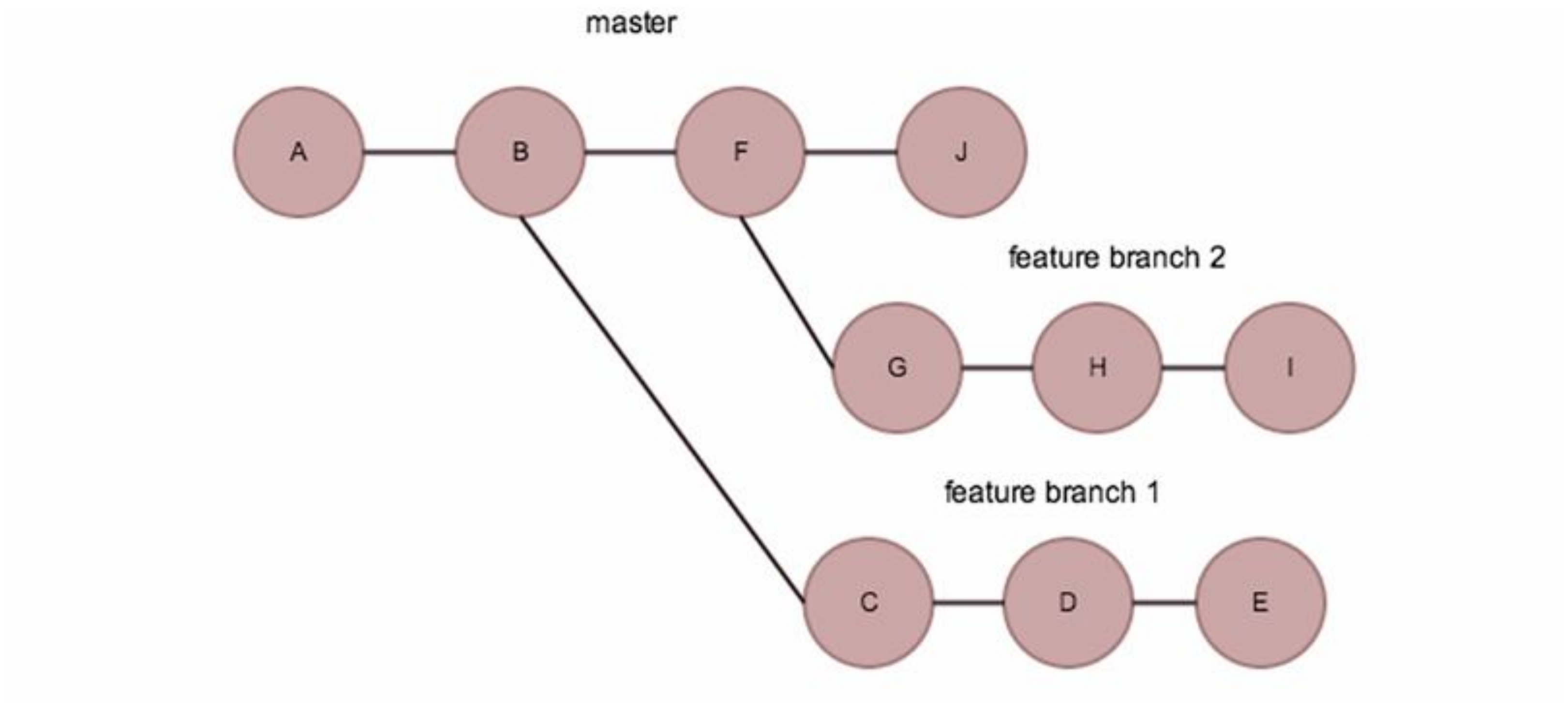
Viewing History

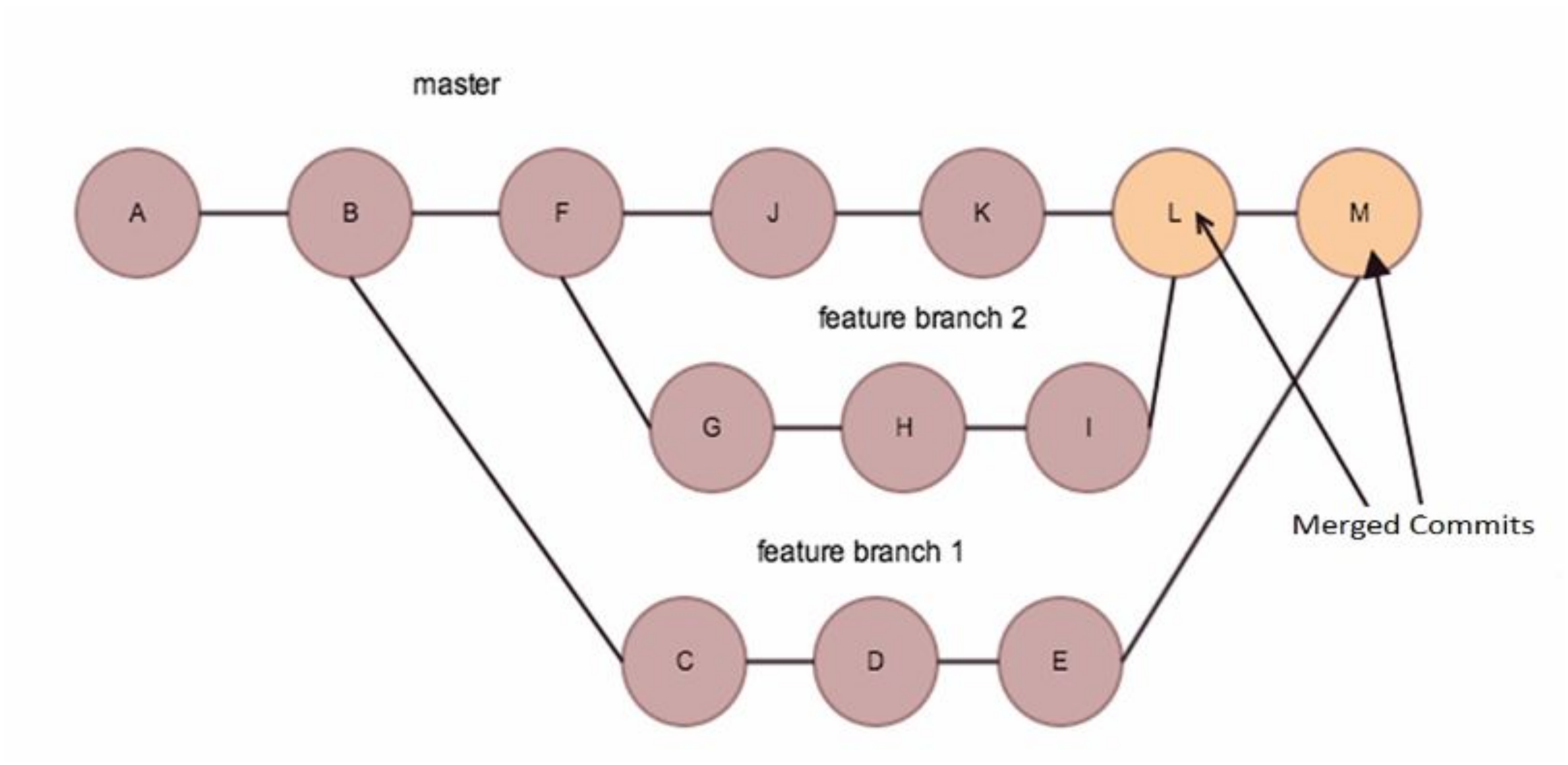
- Origin/master – points to tip of master branch on remote
- HEAD – points to tip of current local branch
- git log command used to see the history
- Use Commit hash to view the state of the project at any point in history



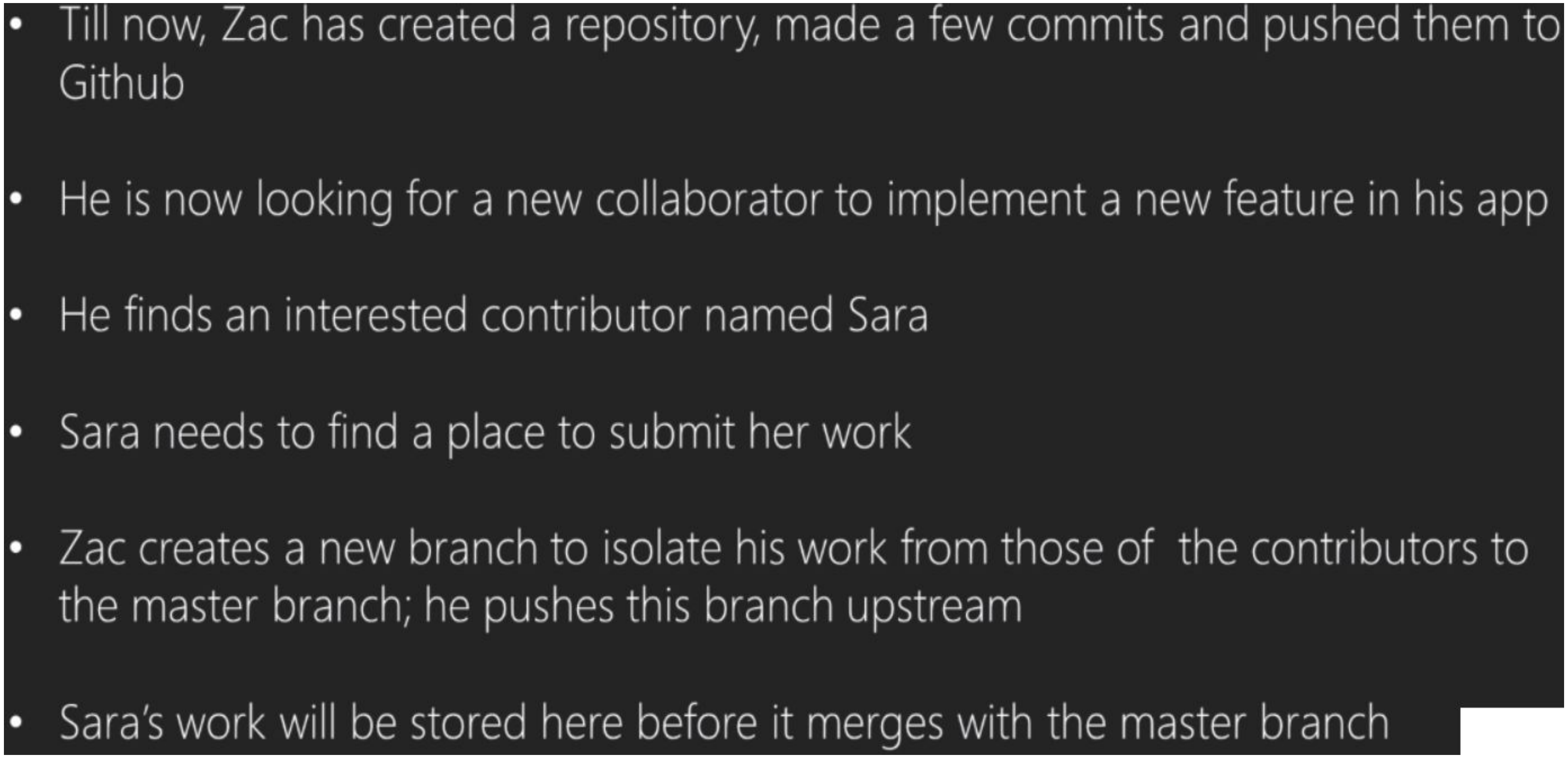
Branching and Forking

- Origin/master – points to tip of master branch on remote
- HEAD – points to tip of current local branch
- git log command used to see the history
- Use Commit hash to view the state of the project at any point in history




master
A
B
F
J
K
L
M
feature branch 2
G
H
I
feature branch 1
C
D
E
Merged Commits

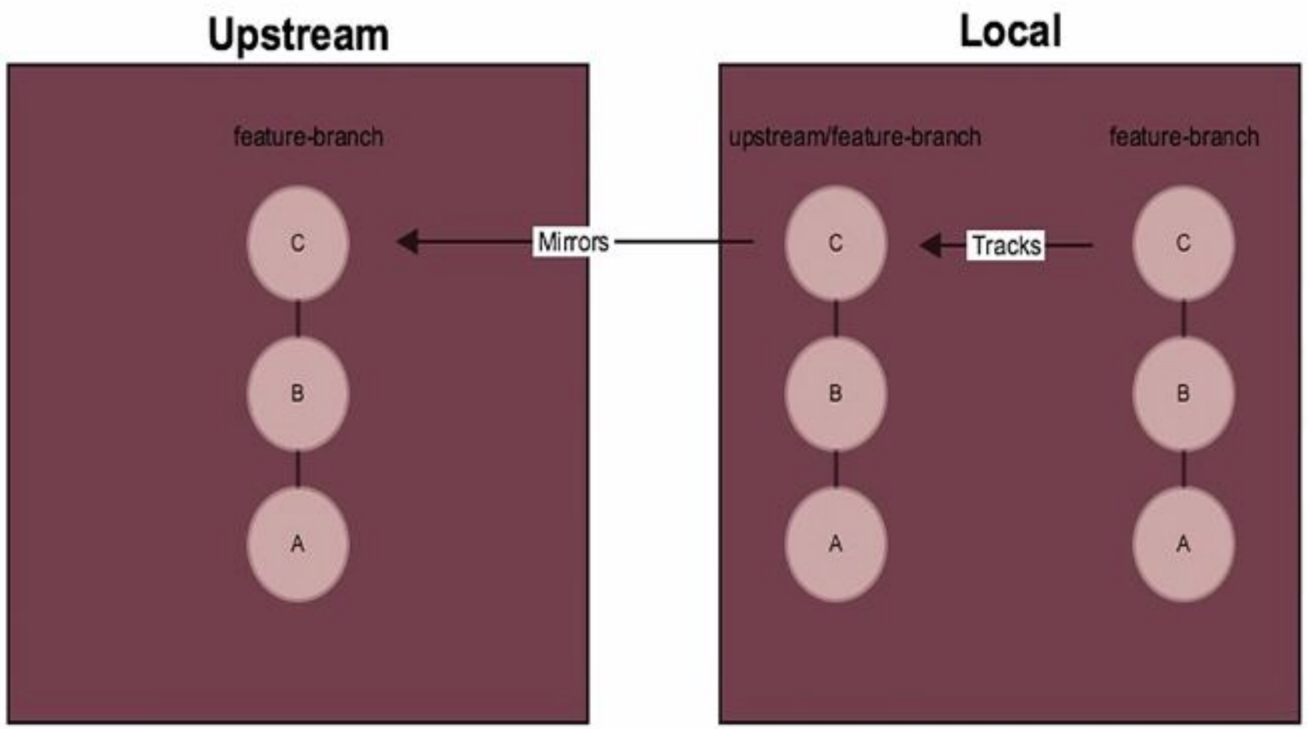
Ethan's
TRAINING | RECRUITMENT | CONSULTANCY

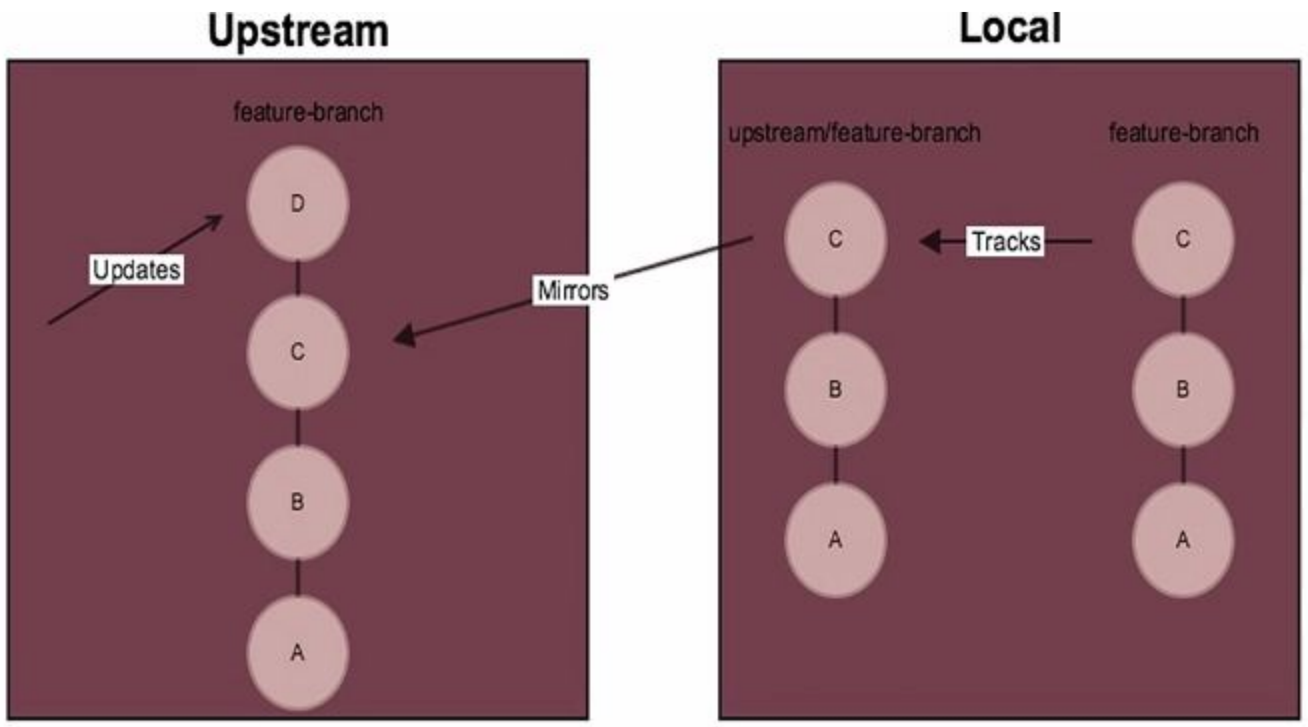


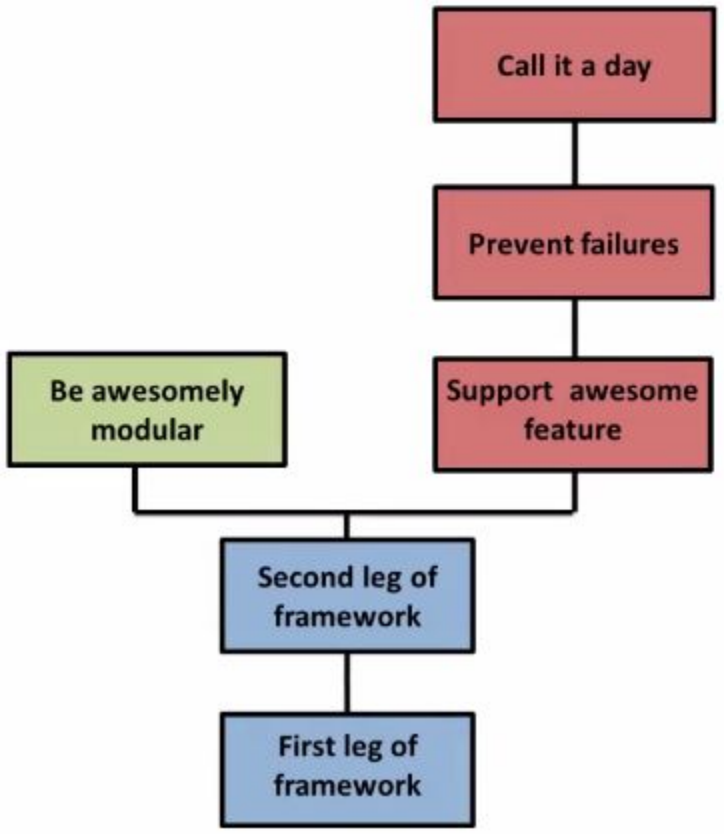
- Till now, Zac has created a repository, made a few commits and pushed them to Github
- He is now looking for a new collaborator to implement a new feature in his app
- He finds an interested contributor named Sara
- Sara needs to find a place to submit her work
- Zac creates a new branch to isolate his work from those of the contributors to the master branch; he pushes this branch upstream
- Sara's work will be stored here before it merges with the master branch

- --Branching Example
- git branch my-awsome-feature
- git push origin my-awsome-feature

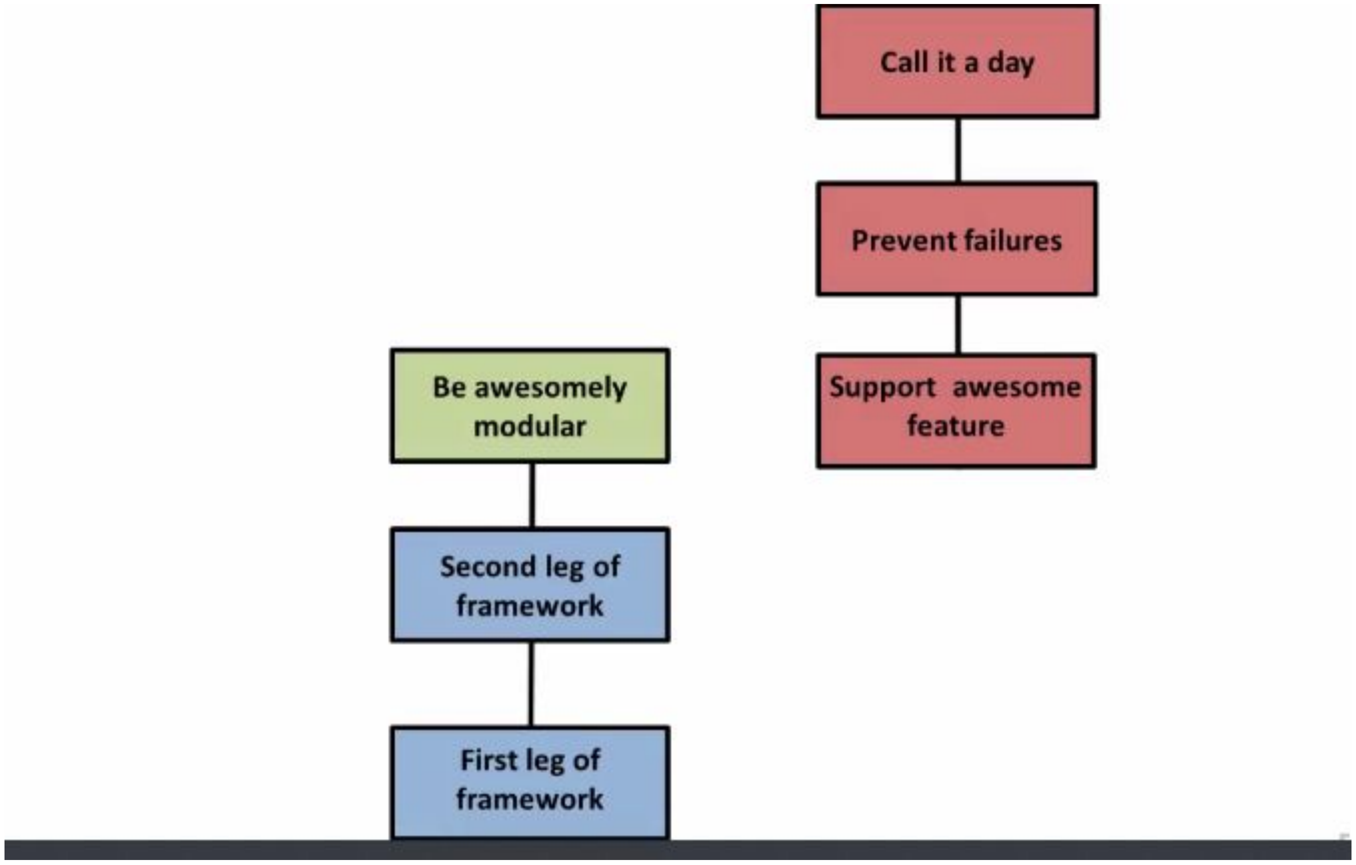
- ---Forking Example
- git clone git@github.com:shyamkharwadkar/gitdem02.git
- git remote add upstream https://github.com/maheshkharwadkar/gitdem02.git
- git remote show


Upstream
Local
feature-branch
upstream/feature-branch
feature-branch
C
B
A
Mirrors
Tracks

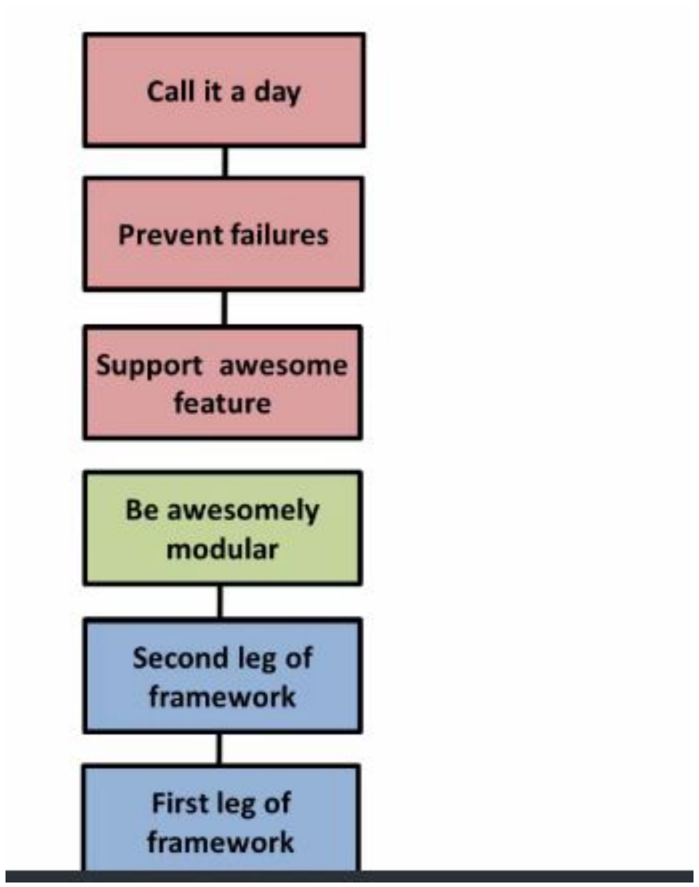

Upstream
Local
feature-branch
D
C
B
A
Updates
Mirrors
upstream/feature-branch
feature-branch
C
B
A
Tracks
C
B
A


Call it a day
Prevent failures
Be awesomely modular
Support awesome feature
Second leg of framework
First leg of framework

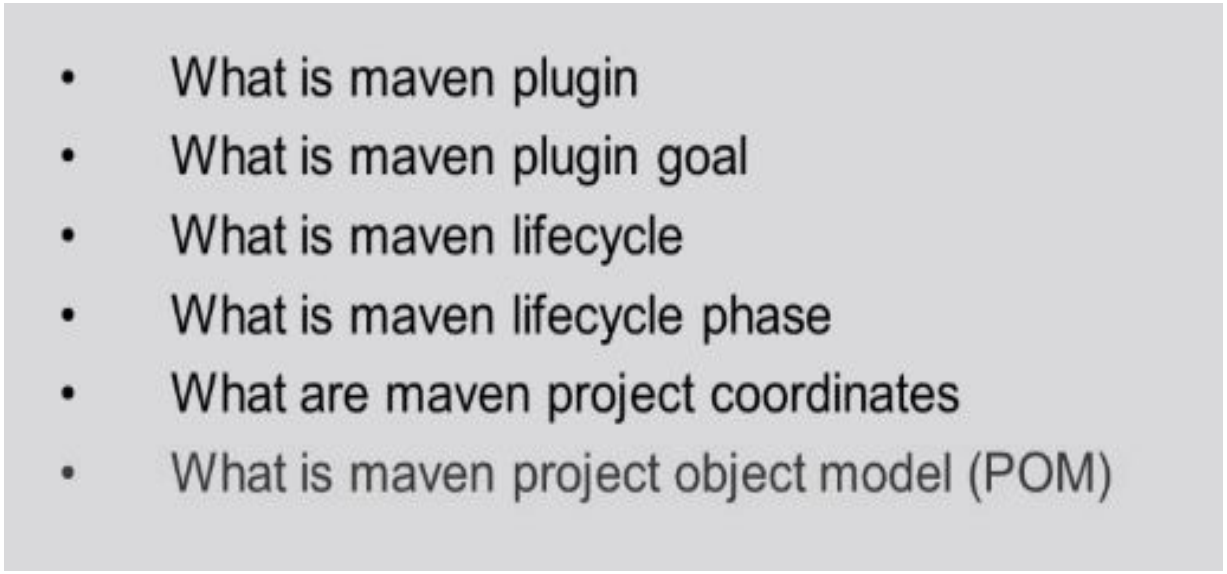
- git fetch upstream
- git checkout --track upstream/my-awssome-feature
- git pull << Update local branch>>
- git fetch
- git status


Call it a day
Prevent failures
Support awesome feature
Be awesomely modular
Second leg of framework
First leg of framework

- Rebasing - Detaching your commits from the point of divergence
- **git pull --rebase**

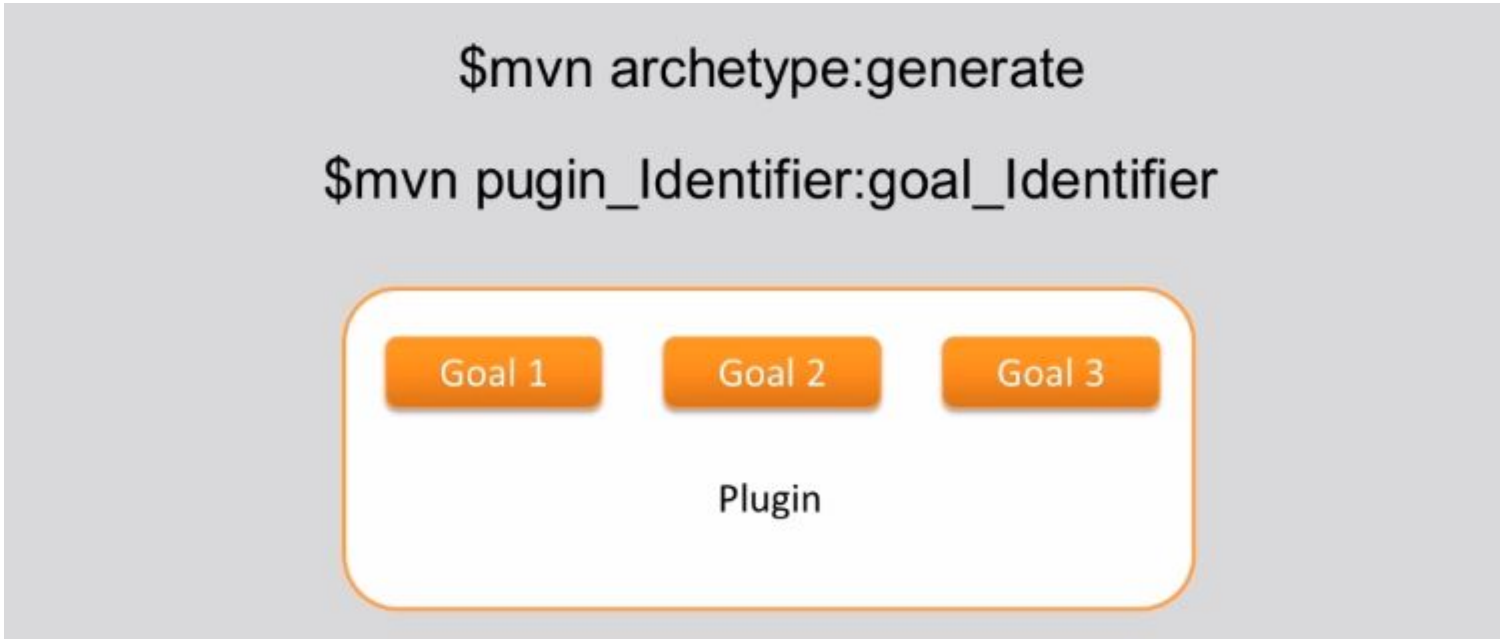

Call it a day
Prevent failures
Support awesome feature
Be awesomely modular
Second leg of framework
First leg of framework

Maven



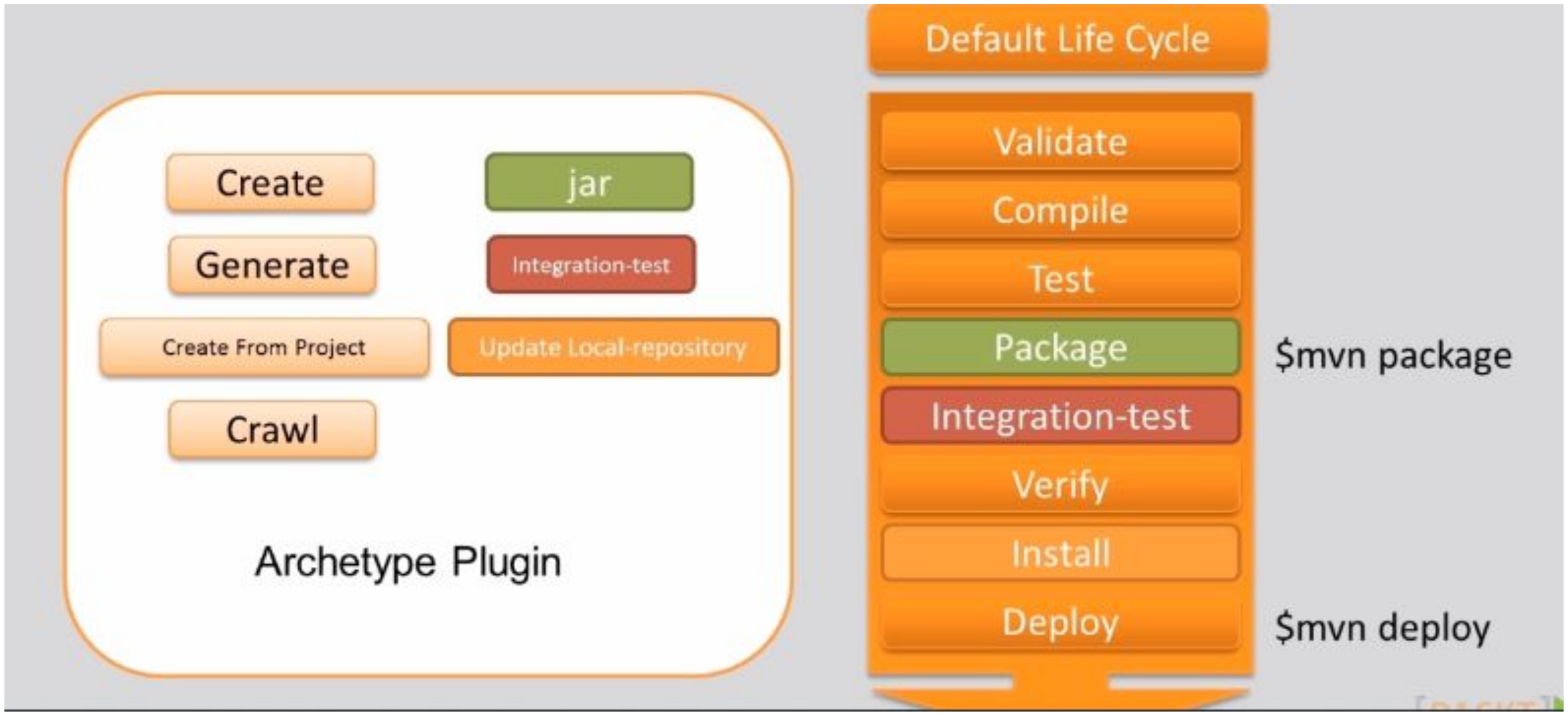
- What is maven plugin
- What is maven plugin goal
- What is maven lifecycle
- What is maven lifecycle phase
- What are maven project coordinates
- What is maven project object model (POM)

What is Maven Plugin

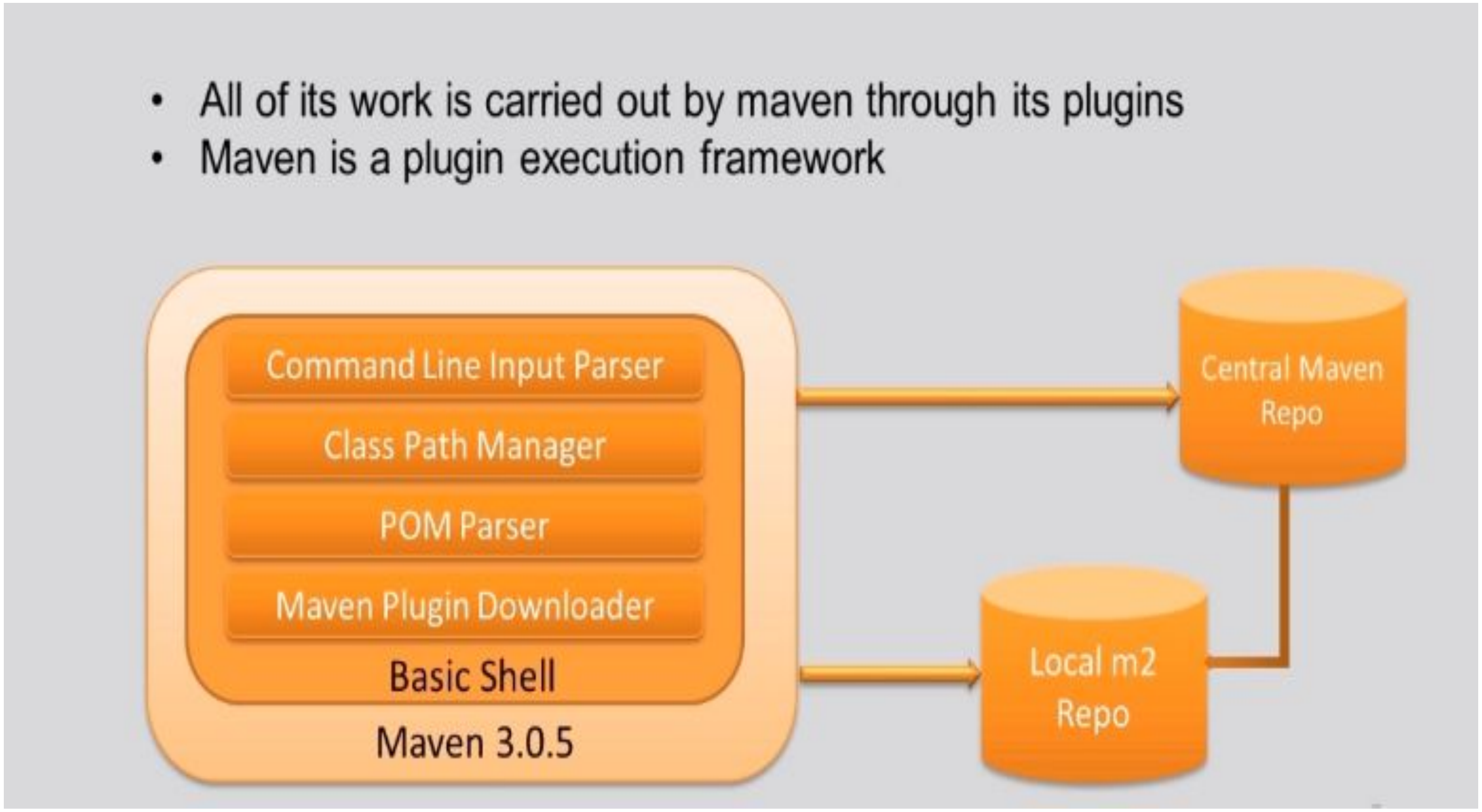

```
$mvn archetype:generate

$mvn pugin_Identifier:goal_Identifier
```

What is Maven Plugin



Maven Plugin Architecture

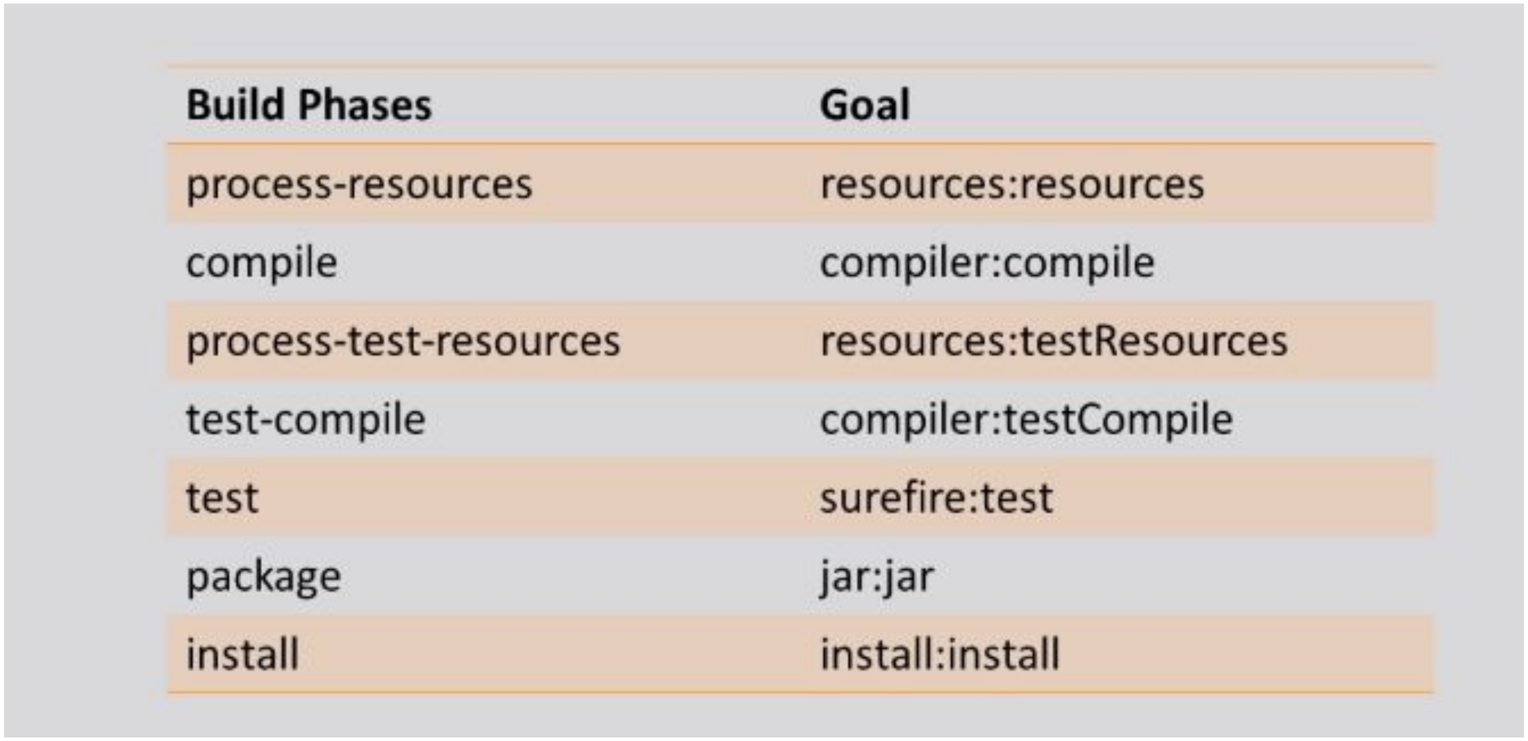


- All of its work is carried out by maven through its plugins
- Maven is a plugin execution framework

What is Maven Lifecycle

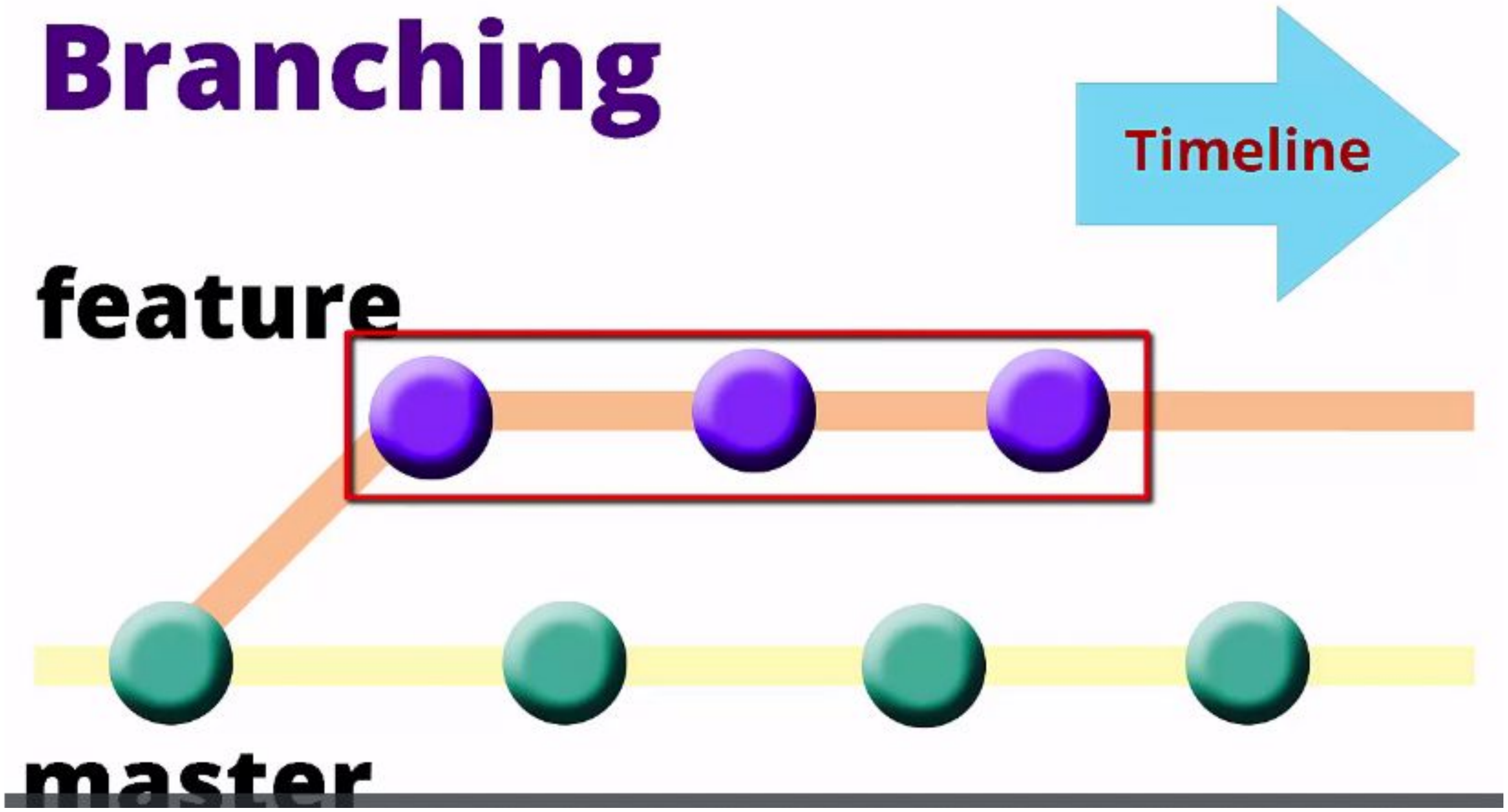
- Maven plugins can be executed in two ways
  - Direct execution
  - Lifecycle execution
- Built-in lifecycles of maven
  - Default
  - Clean
  - Site
- When we execute Default lifecycle
  - Validate the project
  - Compile the project sources
  - Run the project unit tests
  - Package the project binaries
  - Run integration tests against your project's package
  - Install the package into local repository
  - Finally deploy the package into the specified environment

Execution of Default Lifecycle

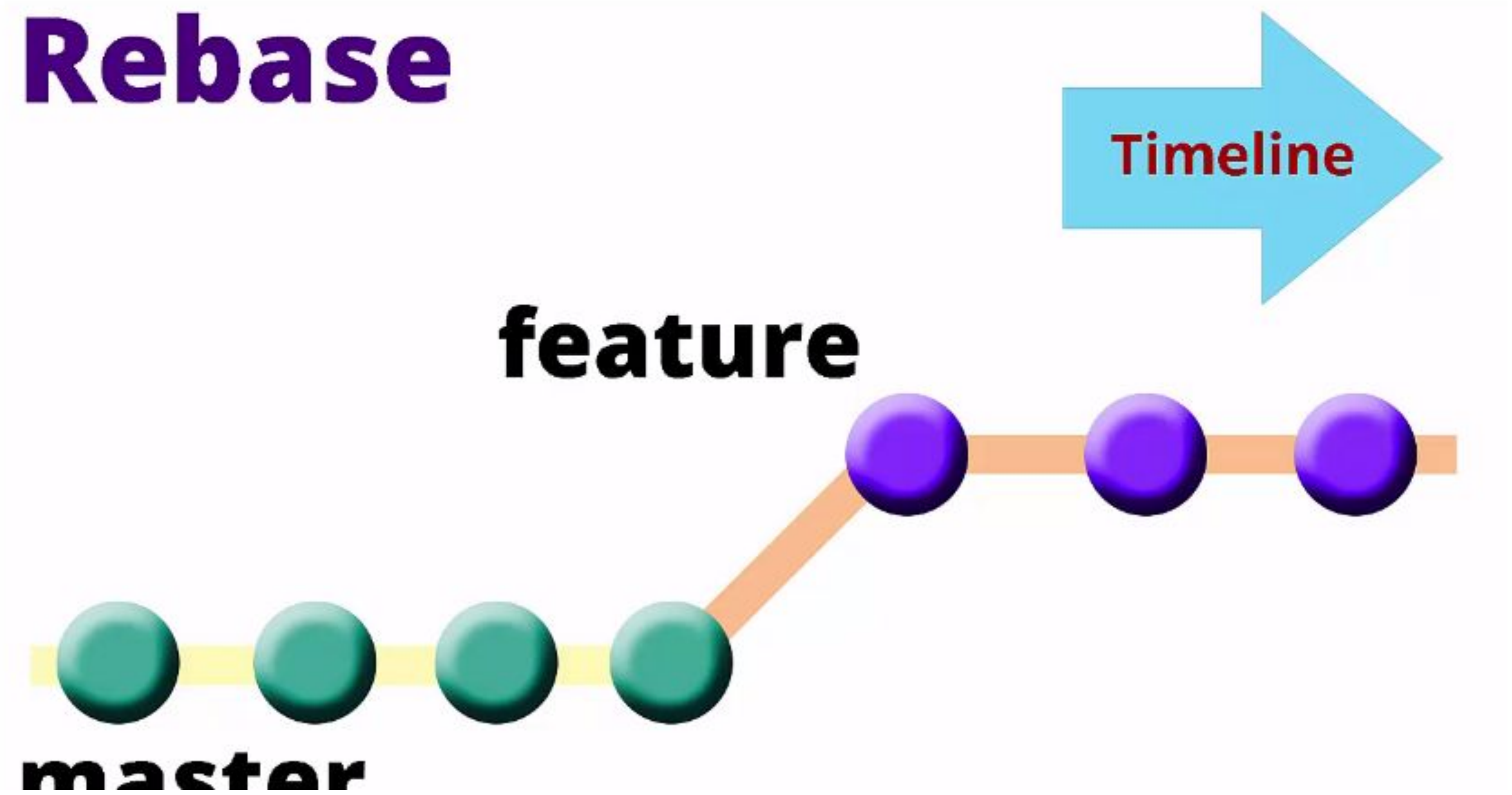


Build Phases	Goal
process-resources	resources:resources
compile	compiler:compile
process-test-resources	resources:testResources
test-compile	compiler:testCompile
test	surefire:test
package	jar:jar
install	install:install

Simple Rebase Example



Simple Rebase Example


Rebase
Timeline
feature
master