

# GIT Branching Model Development

Monday, December 7, 2020 9:51 AM

## 1. Git Branching Model Development

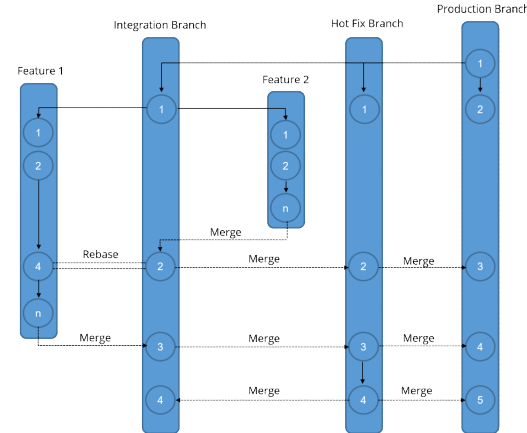
### DESCRIPTION

Create a branching model to help your team understand the Git Feature Branch Workflow for faster and efficient integration of work

#### Background of the problem statement:

M-theta Technology Solutions hired you as a DevOps Architect. It is undergoing an infrastructural change to implement DevOps to develop and deliver the products. Since M-theta is an Agile organization, they follow the Scrum methodology to develop the projects incrementally. Hence, the company wants to adopt Git as a Source Code Management (SCM) tool for faster integration of work and smooth transition into DevOps.

So, as a DevOps Architect, you have been asked to build a branching model to demonstrate the Git Feature Branch Workflow for the company's engineering team. In the branching model, you are required to create a Production branch which will act as the main (master) branch, an Integration branch which will again have two branches inside it namely Feature 1 and Feature 2, and a Hotfix branch which will be used for fixing any issues that could come up from Integration or Production branches.



#### You must use the following:

Git: To build the branching model

#### Steps to perform:

1. Start with the Production branch (master branch), and then create a HotFix and Integration branch
2. Subsequently, create Feature 1 and 2 branches that integrate to the Integration branch as shown in the above figure
3. Commit some changes in the Feature 2 branch and merge it into the Integration branch. Delete this branch once merging is complete
4. Commit some changes in the Feature 1 branch and rebase it to the Integration branch
5. Merge the Integration branch into Hotfix and Production branch to update these branches
6. Commit some changes in Feature 1 branch, and then merge it into Integration, Hotfix, and Production branch. Delete this branch once merging is complete
7. Commit some changes in the Hotfix branch and merge it into the Production as well as the Integration branch

- Create a directory called Assessment then initialize git

```
$ mkdir Assessment
$ cd Assessment
$ git clone https://github.com/DevOpsArchitect/Assessment
$ git init
```

```
ares@ares:~/git$ mkdir Assessment
ares@ares:~/git$ cd Assessment/
ares@ares:~/git/Assessment$ ls
ares@ares:~/git/Assessment$ git init
Initialized empty Git repository in /home/ares/git/Assessment/.git/
ares@ares:~/git/Assessment$ ls
ares@ares:~/git/Assessment$ ls -la
total 12
drwxr-xr-x  3 ares ares 4096 Dec  7 22:17 .
drwxr-xr-x 15 ares ares 4096 Dec  7 22:17 ..
drwxr-xr-x  7 ares ares 4096 Dec  7 22:17 .git
ares@ares:~/git/Assessment$
```

- Renaming master and assigning a new master name

```
$ git branch -m master oldMaster => this will rename the master as oldMaster
$ git branch -m Production master => this will assign Production as master
```

```
ares@ares:~/git/Assessment/Assessment$ git branch
* Production
  master
```

- Go inside your Production branch and create two branches HotFix and Integration

```
$ git checkout Production
$ git branch HotFix
$ git branch Integration
```

```
ares@ares:~/git/Assessment/Assessment$ git branch
* Production
  master
ares@ares:~/git/Assessment/Assessment$ git branch HotFix
ares@ares:~/git/Assessment/Assessment$ git branch Integration
ares@ares:~/git/Assessment/Assessment$ git branch
  HotFix
  Integration
* Production
  master
ares@ares:~/git/Assessment/Assessment$
```

- Go inside Integration branch and create 2 sub branches under the Integration branch

```
$ git checkout Integration
$ git branch Feature1
$ git branch Feature2
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Integration
Switched to branch 'Integration'
ares@ares:~/git/Assessment/Assessment$ git branch
  HotFix
  Integration
* Production
  master
ares@ares:~/git/Assessment/Assessment$ git branch Feature 1
fatal: Not a valid object name: '1'.
ares@ares:~/git/Assessment/Assessment$ git branch Feature1
ares@ares:~/git/Assessment/Assessment$ git branch Feature2
ares@ares:~/git/Assessment/Assessment$ git branch
  Feature1
  Feature2
  HotFix
  Integration
* Production
  master
ares@ares:~/git/Assessment/Assessment$
```

- Go inside Feature2 branch and commit some changes. Once changes are committed, merge Feature2 branch with Integration branch and delete Feature2 branch.

```
$ git checkout Feature2
$ echo "This file is created inside Feature2 branch" > features.txt
$ git add
$ git commit -am "features.txt file has been added inside Feature2 branch"
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Feature2
Switched to branch 'Feature2'
ares@ares:~/git/Assessment/Assessment$ ls
README.md  TextFiles
ares@ares:~/git/Assessment/Assessment$ echo "This file is created inside Feature2 branch" > features.txt
ares@ares:~/git/Assessment/Assessment$ cat features.txt
This file is created inside Feature2 branch
```

```
$ git checkout Integration
$ git merge Feature2
$ git branch -d Feature2
```

```
ares@ares:~/git/Assessment/Assessment$ git add .
ares@ares:~/git/Assessment/Assessment$ git commit -am "Features.txt file has been added inside Feature2 branch"
[Feature2 0a8208b] features.txt file has been added inside Feature2 branch
1 file changed, 1 insertion(+)
create mode 100644 features.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      121035c TextFile Folder Added
* Feature2    0a8208b features.txt file has been added inside Feature2 branch
HotFix       121035c TextFile Folder Added
Integration  121035c TextFile Folder Added
Production   121035c TextFile Folder Added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Integration
Switched to branch 'Integration'
ares@ares:~/git/Assessment/Assessment$ git merge Feature2
Updating 121035c..0a8208b
Fast-forward
 features.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 features.txt
ares@ares:~/git/Assessment/Assessment$ git branch -d Feature2
Deleted branch Feature2 (was 0a8208b)
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      121035c TextFile Folder Added
HotFix       121035c TextFile Folder Added
* Integration 0a8208b features.txt file has been added inside Feature2 branch
Production   121035c TextFile Folder Added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$
```

-Commit changes inside Features1 branch and rebase it with Integration branch

```
$ git checkout Feature1
$ echo "New features have been added" > newfeatures.txt
$ git add
$ git commit -am "newfeatures.txt file added inside Feature1 branch"
$ git checkout Integration
$ git rebase Feature1
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Feature1
Switched to branch 'Feature1'
ares@ares:~/git/Assessment/Assessment$ git branch -av
* Feature1      121035c TextFile Folder Added
HotFix       121035c TextFile Folder Added
Integration  0a8208b features.txt file has been added inside Feature2 branch
Production   121035c TextFile Folder Added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ echo "New features have been added" > features.txt
ares@ares:~/git/Assessment/Assessment$ cat features.txt
New features have been added
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Integration
Switched to branch 'Integration'
ares@ares:~/git/Assessment/Assessment$ git rebase Feature1
First, rewinding head to replay your work on top of it...
Applying: features.txt file has been added inside Feature2 branch
ares@ares:~/git/Assessment/Assessment$ ls
features.txt newfeatures.txt README.md TextFiles
ares@ares:~/git/Assessment/Assessment$
```

-Merge Integration branch with HotFix and Production branch

```
$ git checkout HotFix
$ git merge Integration
$ git checkout Production
$ git merge HotFix
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout HotFix
Switched to branch 'HotFix'
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      6ecaabb newfeatures.txt file added inside Feature1 branch
* HotFix      121035c TextFile Folder Added
Integration  7bb10bb features.txt file has been added inside Feature2 branch
Production   121035c TextFile Folder Added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ git merge Integration
Updating 121035c..7bb10bb
Fast-forward
 features.txt | 1 +
newfeatures.txt | 1 +
2 files changed, 2 insertions(+)
create mode 100644 features.txt
create mode 100644 newfeatures.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      6ecaabb newfeatures.txt file added inside Feature1 branch
* HotFix      7bb10bb features.txt file has been added inside Feature2 branch
Integration  7bb10bb features.txt file has been added inside Feature2 branch
Production   121035c TextFile Folder Added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ git checkout Production
Switched to branch 'Production'
ares@ares:~/git/Assessment/Assessment$ git merge HotFix
Updating 121035c..7bb10bb
Fast-forward
 features.txt | 1 +
newfeatures.txt | 1 +
2 files changed, 2 insertions(+)
create mode 100644 features.txt
create mode 100644 newfeatures.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      6ecaabb newfeatures.txt file added inside Feature1 branch
HotFix       7bb10bb features.txt file has been added inside Feature2 branch
* Integration 7bb10bb features.txt file has been added inside Feature2 branch
Production   7bb10bb features.txt file has been added inside Feature2 branch
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$
```

-Commit some changes in Feature1 branch and then merge Feature1 branch into Integration, HotFix and Production branch. Delete Feature1 branch once merging is completed.

```
$ git checkout Feature1
$ echo "Another feature has been added inside Feature1 branch" > anotherfeature.txt
$ git add
$ git commit -am "anotherfeature.txt file has been added inside Feature1 branch"
```

```
ares@ares:~/git/Assessment/Assessment$ git checkout Feature1
Switched to branch 'Feature1'
ares@ares:~/git/Assessment/Assessment$ git branch -av
* Feature1      6ecaabb newfeatures.txt file added inside Feature1 branch
HotFix       7bb10bb features.txt file has been added inside Feature2 branch
Integration  7bb10bb features.txt file has been added inside Feature2 branch
Production   7bb10bb features.txt file has been added inside Feature2 branch
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ echo "Another feature has been added inside Feature1 branch" > anotherfeature.txt
ares@ares:~/git/Assessment/Assessment$ cat anotherfeature.txt
Another feature has been added inside Feature1 branch
ares@ares:~/git/Assessment/Assessment$ git add .
ares@ares:~/git/Assessment/Assessment$ git commit -am "anotherfeatures.txt file has been added inside Feature1 branch"
[Feature1 26ab600] anotherfeatures.txt file has been added inside Feature1 branch
1 file changed, 1 insertion(+)
create mode 100644 anotherfeature.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
* Feature1      26ab600 anotherfeatures.txt file has been added inside Feature1 branch
HotFix       7bb10bb features.txt file has been added inside Feature2 branch
Integration  7bb10bb features.txt file has been added inside Feature2 branch
Production   7bb10bb features.txt file has been added inside Feature2 branch
master       121035c TextFile Folder Added
```

\$ git checkout Integration  
\$ git merge Feature1  
\$ git checkout HotFix  
\$ git merge Integration  
\$ git checkout Production  
\$ git merge HotFix  
\$ git branch -d Feature1

```
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$

ares@ares:~/git/Assessment/Assessment$ git checkout Integration
Switched to branch 'Integration'
ares@ares:~/git/Assessment/Assessment$ git merge Feature1
Merge made by the 'recursive' strategy.
anotherfeature.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 anotherfeature.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      26ab600 anotherfeatures.txt file has been added inside Feature1 branch
HotFix       7bb10bb features.txt file has been added inside Feature2 branch
* Integration afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
Production   7bb10bb features.txt file has been added inside Feature2 branch
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ git checkout HotFix
Switched to branch 'HotFix'
ares@ares:~/git/Assessment/Assessment$ git merge Integration
Updating 7bb10bb..afc203f
Fast-forward
anotherfeature.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 anotherfeature.txt
ares@ares:~/git/Assessment/Assessment$ git checkout Production
Switched to branch 'Production'
ares@ares:~/git/Assessment/Assessment$ git merge HotFix
Updating 7bb10bb..afc203f
Fast-forward
anotherfeature.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 anotherfeature.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
Feature1      26ab600 anotherfeatures.txt file has been added inside Feature1 branch
HotFix       afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
Integration   afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
* Production   afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$

ares@ares:~/git/Assessment/Assessment$ git branch -d Feature1
Deleted branch Feature1 (was 26ab600).
ares@ares:~/git/Assessment/Assessment$ git branch -av
HotFix       afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
Integration   afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
* Production   afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$
```

-Commit changes inside HotFix branch and merge these changes into Production and Integration branch.

\$ git checkout HotFix  
\$ echo "Quick fix for crashing issues" > fix.txt  
\$ git add  
\$ git commit -am "fix.txt file has been added"  
\$ git checkout Integration  
\$ git merge HotFix  
\$ git checkout Production  
\$ git merge HotFix

```
ares@ares:~/git/Assessment/Assessment$ git checkout HotFix
Switched to branch 'HotFix'
ares@ares:~/git/Assessment/Assessment$ ls
anotherfeature.txt  features.txt  newfeatures.txt  README.md  TextFiles
ares@ares:~/git/Assessment/Assessment$ git branch -av
* HotFix       afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
Integration     afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
Production     afc203f Merge branch 'Feature1' into Integration New feature has been added to the software.
master         121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$ echo "Quick fix for crashing issues" > fix.txt
ares@ares:~/git/Assessment/Assessment$ git add .
ares@ares:~/git/Assessment/Assessment$ git commit -am "Fix.txt file has been added"
[HotFix 871a1bd] Fix.txt file has been added
1 file changed, 1 insertion(+)
create mode 100644 fix.txt
ares@ares:~/git/Assessment/Assessment$ git checkout Integration
Switched to branch 'Integration'
ares@ares:~/git/Assessment/Assessment$ git merge HotFix
Updating afc203f..871a1bd
Fast-forward
fix.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 fix.txt
ares@ares:~/git/Assessment/Assessment$ git checkout Production
Switched to branch 'Production'
ares@ares:~/git/Assessment/Assessment$ git merge HotFix
Updating afc203f..871a1bd
Fast-forward
fix.txt | 1 +
1 file changed, 1 insertion(+)
create mode 100644 fix.txt
ares@ares:~/git/Assessment/Assessment$ git branch -av
HotFix       871a1bd Fix.txt file has been added
Integration   871a1bd Fix.txt file has been added
* Production   871a1bd Fix.txt file has been added
master       121035c TextFile Folder Added
remotes/origin/HEAD -> origin/main
remotes/origin/main 121035c TextFile Folder Added
ares@ares:~/git/Assessment/Assessment$
```