

# Salesforce Development Methodology

May 15<sup>th</sup>, 2018

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Program Architect



# Agenda

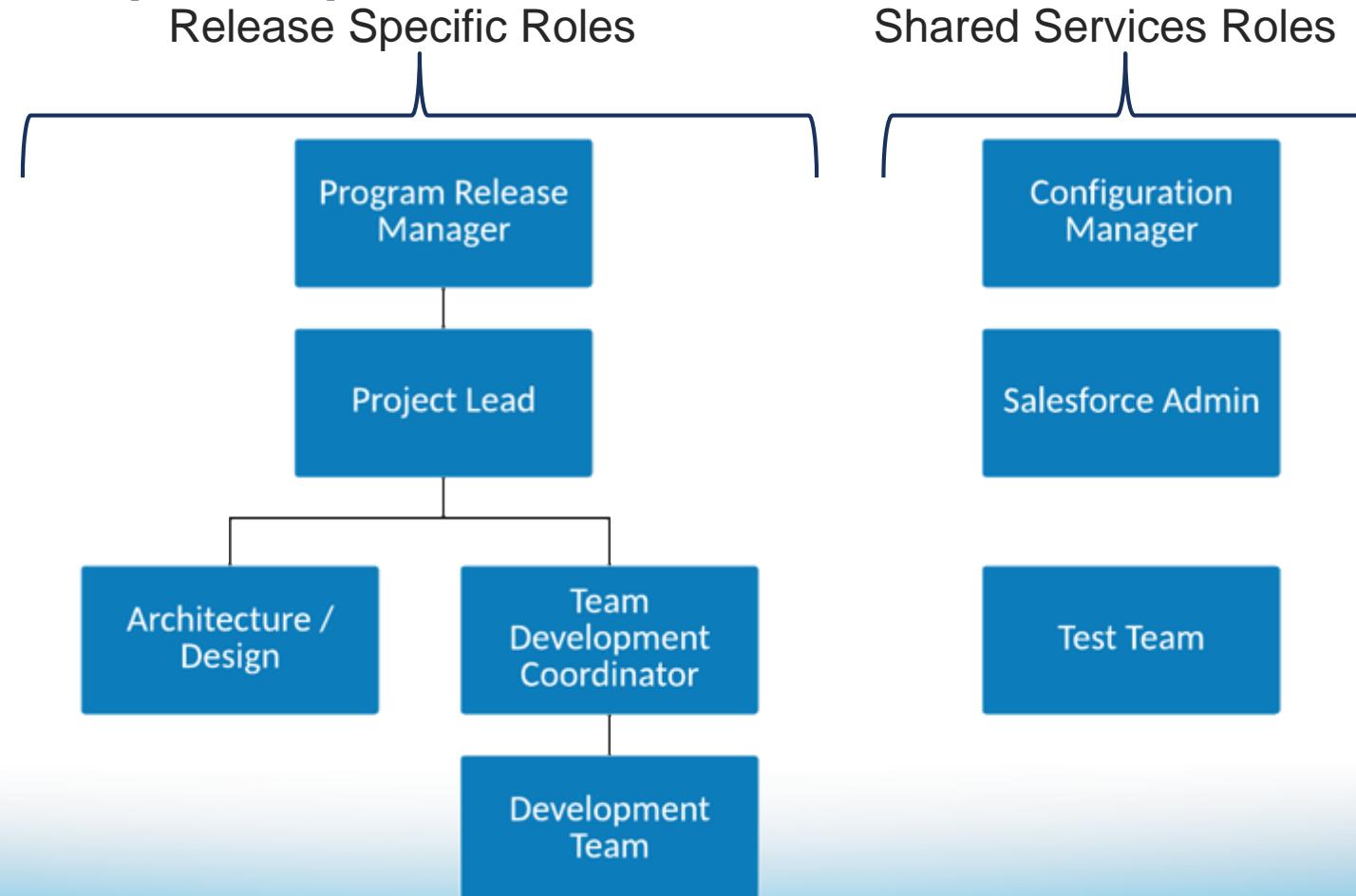
- Overview
  - Guiding Principles
  - Roles
  - Governance
  - Environment Overview
- Trunks, Branches, and Releases
- Development Tools and Process
- Training

# Overview

# Guiding Principles

- New build, enhancements, and changes must be tracked and approved in Application Enhancement Requests and DTC Exception Requests
- Major changes (workflows, validation rules) **shall not be done** directly in Production (test in lower env, then migrate for traceability and regression testing)
- Developers work in the same environment as much as possible (exceptions are POC's)
- All code is stored in a centralized repository
- Developers and admins have a standardized developer workstation, and follow the same processes to update code to the centralized repository
- Code is only moved from environment to environment from the centralized repository
- Code migration is automated and repeatable
- Admin privileges in higher environments should be restricted to prevent developers from making changes directly
- Manual tasks that cannot be automated should be documented in Excel that is checked in/out of GitHub

# Roles (1 of 3)



# Roles (2 of 3)

Role	Task
Program Release Manager	<ul style="list-style-type: none"><li>➤ Coordinate and plan the development projects (work streams) for code drops and merges to SIT, SIT2, UAT, and Production</li><li>➤ Coordinate code migrations, smoke tests, data migration, testing, etc. for the Release</li><li>➤ Conduct Change Control Board</li><li>➤ Create and set release dates for all features and enhancements</li></ul>
Project Lead	<ul style="list-style-type: none"><li>➤ Coordinate and plan the overall efforts for the project – Requirements, Design, Build, Test, and Deploy<ul style="list-style-type: none"><li>➤ Maintain detailed tasks, milestones and dependencies</li></ul></li><li>➤ Manage weekly status reports</li><li>➤ Coordinate Architectural Design activities</li><li>➤ Plan various development activities with each Team Development Coordinator</li><li>➤ Ensure adherence to Salesforce methodology policies</li></ul>
Architecture / Design	<ul style="list-style-type: none"><li>➤ Support the creation of the solution design:<ul style="list-style-type: none"><li>➤ Business Requirements, Use Cases, Mock-up UIs, Data Model, Security considerations, Data Integration and Migration , Service Assurance, Reports &amp; Dashboard</li></ul></li></ul>
Team Development Coordinator	<ul style="list-style-type: none"><li>➤ Work hand in hand Architecture / Design to be able to create/deliver/review the Technical Design documents</li><li>➤ Coordinate development work and packaging of work products (tagging) for code drops</li><li>➤ Ensure adherence to development standards, guidelines, and methodology<ul style="list-style-type: none"><li>➤ Enforce entry/exit criteria for SDLC development and testing phases</li><li>➤ Coordinate and ensure quality checks (code/peer reviews)</li></ul></li><li>➤ Coordinate branch creation for defect fixing, code drops, etc with the developers</li><li>➤ Create package.xml with respective metadata per the tag to provide to Salesforce Admin for each code drop</li><li>➤ Coordinate Script management / automation for Salesforce Admin (i.e. Custom Settings data migration)</li><li>➤ Create release notes for any manual tasks, known issues, functionality delivered, etc</li></ul>

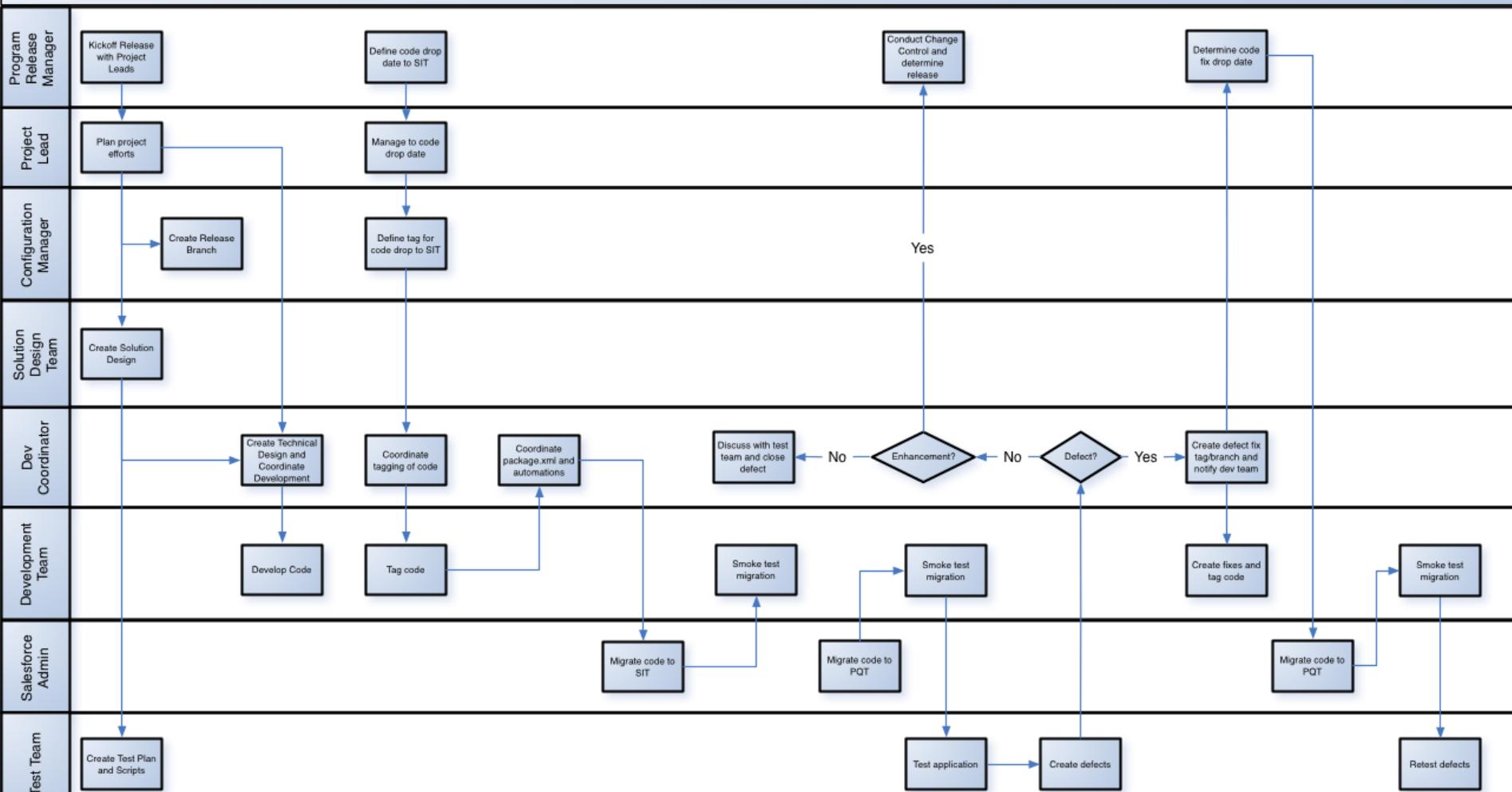


# Roles (3 of 3)

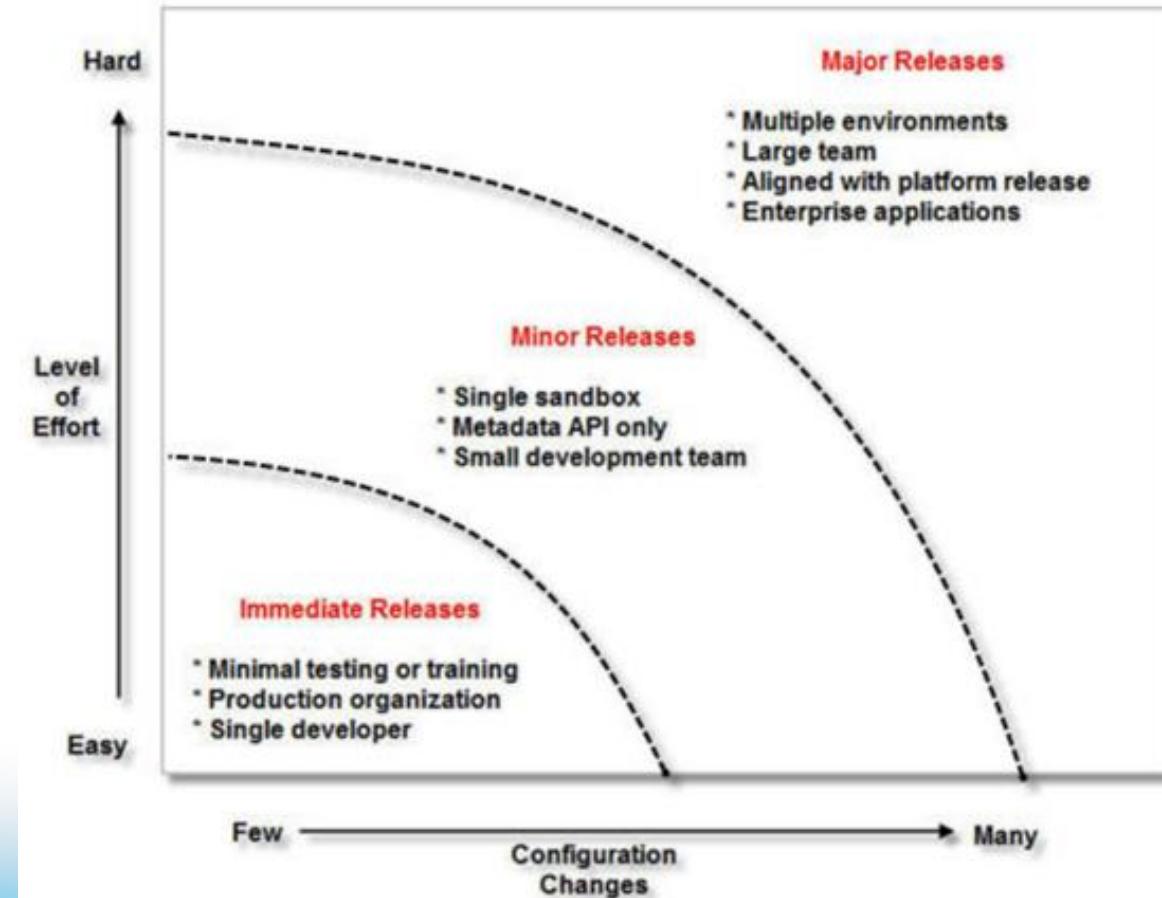
Role	Task
Developers	<ul style="list-style-type: none"><li>➤ Development of code in the development environment. Should have own GitHub and Salesforce logins</li><li>➤ Associate development files to appropriate tag/label specified by Configuration Manager</li><li>➤ Smoke tests after code migrations to the various environments to ensure functionality is working as expected based on the code 'tagged'</li><li>➤ Perform Unit testing and maintain test results</li><li>➤ Ensure code coverage of &gt; 95%</li><li>➤ Adhere to established development standards, guidelines and methodologies</li><li>➤ Responsible for merging and conflict resolution for code merges between branches</li></ul>
Configuration Manager	<ul style="list-style-type: none"><li>➤ Ensure adherence to configuration management policies</li><li>➤ Provide GitHub access</li><li>➤ Responsible for Trunk/branch creation for new releases and service packs</li><li>➤ Responsible for providing tag/label for release and code drops</li><li>➤ Ensure code drop tag is not modified after specified point in time (need to lock)</li></ul>
Salesforce Admin	<ul style="list-style-type: none"><li>➤ Provide Project/Issue access</li><li>➤ Sandbox creation and refreshes</li><li>➤ Code migration to SIT, UAT, Training, and Prod environments</li></ul>
Test Team	<ul style="list-style-type: none"><li>➤ Create test plan and test scripts applicable for the release</li><li>➤ Perform SIT2 on developed product</li><li>➤ Report defects</li></ul>



## Sample Release Management Process



# Governance Model for Changes (1 of 2)



# Governance Model for Changes (2 of 2)

Release Type	Activities	Examples	Level of Effort	Group
L1 Immediate	<ul style="list-style-type: none"> <li>➢ Small changes, rapidly applied directly to Production</li> <li>➢ Min impact to users</li> <li>➢ Outside scope of Change process</li> </ul>	<ul style="list-style-type: none"> <li>➢ Dashboards</li> <li>➢ Reports</li> <li>➢ List Views</li> <li>➢ Data Loads</li> <li>➢ Knowledge Articles</li> </ul>	<p>LOW</p> <ul style="list-style-type: none"> <li>➢ No training required</li> <li>➢ No integration</li> <li>➢ Implemented by DTC</li> </ul>	Business
L2 Minor (Monthly)	<ul style="list-style-type: none"> <li>➢ Minor impact to users</li> <li>➢ Config, test and deploy w/ minor impact to small # of users</li> </ul>	<ul style="list-style-type: none"> <li>➢ New Fields</li> <li>➢ Picklist Values</li> <li>➢ Standard page layouts updates</li> <li>➢ New standard page layouts</li> </ul>	<p>MEDIUM</p> <ul style="list-style-type: none"> <li>➢ &lt; 1 day of training</li> <li>➢ &lt; 1 week of config</li> <li>➢ IT involvement</li> </ul>	DTC
L3 Major (Quarterly)	<ul style="list-style-type: none"> <li>➢ Significant change to business users</li> <li>➢ Major UI change, data migration / integration</li> <li>➢ Apex/VF Code</li> </ul>	<ul style="list-style-type: none"> <li>➢ AppExchange apps</li> <li>➢ Process impacting changes (workflows, validation rules)</li> <li>➢ Visualforce page layouts</li> <li>➢ Data migration</li> <li>➢ Integration changes</li> </ul>	<p>HIGH</p> <ul style="list-style-type: none"> <li>➢ 1+ days training</li> <li>➢ 1+ weeks config</li> <li>➢ 1+ weeks of integration development</li> <li>➢ IT lead</li> </ul>	DTC

# Work Instructions: Application/Enhancement Requests

## Who:

- Project Manager or Business Owner

## When:

- At beginning of each release, the project team creates a request for a new/enhanced application. The project management reviews and reviews the application for work once the requirements have been met.

## Steps:

- Log into VA Production Org
- Access the Application/Enhancement tab
- Create/edit an application enhancement request
- Provide all required details to facilitate more efficient approval

Project/Issue Mana...		Home	Contacts	Reports	Dashboards	DTC Requested Applications	DTC Exception Requests
RELEASE DATE	ENHANCEMENT ID	APP/ENHANCEMENT DESCRIPTION	NEW APPLICATION NAME	EXISTING APPLICATION	OUT OF SCOPE	STATUS	
<b>In flight Applications</b>							
32 Items - Sorted by Release Date - Updated 2 minutes ago							
1	03/26/18 Enhancement-000184	Views Archival functionality- Sprint 3 Code push for archival...	Views Archival functionality...	VIEWS		Under Development	
2	FY2018 TBD Enhancement-000133	We currently don't have the ability to go back and correct a li...				New	
3	FY2018 TBD Enhancement-000153	Update the apex class to address the issues created by WATRS...	WATRS Winter 18 Flows fix		5/31/2017	New	
4	FY2018 TBD Enhancement-000018	<<<FORM exists in FORMDEV and FORMDESVT - do not overwri...	FORM Automation			In UAT	
5	03/26/17 Enhancement-000165	access	Finance			New	
6	06/30/17 Enhancement-000098	QMS - I'll be doing IPRs/Peer reviews.	QMS			New	
7	06/30/17 Enhancement-000003	This is a new application scheduled for initial release.	WATRS	WATRS	6/19/2017	Implemented&Approved in...	
8	06/30/17 Enhancement-000006	QMS (Quality Management System)	QMS		6/19/2017	Implemented&Approved in...	
9	06/30/17 Enhancement-000209	In regards to the Time Tracker object. Please set up the sort...	WATRS			New	
10	07/28/17 Enhancement-000116	It would save a lot of time if WATRS was similar to VRMAS wh...				New	
11	07/28/17 Enhancement-000074	Enable profile-based Chatter and DISABLE Chatter for VBA u...		WATRS		Implemented&Approved in...	
12	08/25/17 Enhancement-000094	This release is to include any updates to WATRS that will be ...	WATRS Enhancement	WATRS		Implemented&Approved in...	
13	09/29/17 Enhancement-000108	Develop WATRS Wave reports for Phase A: Build Elapsed tim...	WATRS - Wave	WATRS	9/15/2017	Implemented&Approved in...	
14	09/29/17 Enhancement-000113	Allow QRS ability to review historic reviews in an effort to off...				Rejected	
15	09/29/17 Enhancement-000125	Migrate all Data from VAIQ into Views Archival Data Model	VIEWS - Data Migration	VIEWS		Implemented&Approved in...	
16	09/29/17 Enhancement-000129	This in-cycle release is to include WATRS post-go-live updates...	WATRS	WATRS		Implemented&Approved in...	
17	10/27/17 Enhancement-000155	Sprint 2 User stories to develop-in Salesforce for VAIQ Archiv...	Views-VAIQ-Data Migration...	VIEWS		Implemented&Approved in...	
18	11/26/17 Enhancement-000189	This request is opened for VAIQ Data Migration validation	Cf: VAIQ Data Migration Lo...	VIEWS	11/17/2017	Deployed to Prod, Not Valid	
19	11/24/17 Enhancement-000130	Innovators Network is a group within VA Center for Innovati...	Innovators Network			Implemented&Approved in...	
20	Removed Enhancement-000100	QMS ETA VBMS Outlook auto notify employee of feedback a...				New	
21	Removed Enhancement-000093	Please put the date of the Rating Decision you would like us ...	QMS (Quality Management...			New	
22	Removed Enhancement-000194	User needs access to WATRS	Keith Brown			New	

# Work Instructions: DTC Exception Requests

## Who:

- Development teams

## When:

- When a requirement requires additional fields or capabilities beyond configuration, a DTC Exception request needs to be filed to require agreement from the team
- Developer meeting attendees should review the list weekly and determine whether to accept/reject
- If accepted, the development team should prepare to move forward in the development cycle

## Steps:

- Log into the VA production account
- Access the DTC Exception Requests tab
- Create/edit a DTC exception request
- Provide all required details to facilitate more efficient approval

DTCTC ...	APPLICATION NAME	EXCEPTION REQUEST TYPE	EPIC/USER STORY	STATUS	CREATED BY	CREATED DATE	LAST MODIFIED D...
1	QIS PPM Application	Code Exception	IMS Major Milestones: Under...	Approved	Chaitanya Regunath	2/1/2017 9:32 PM	2/16/2017 12:29 PM
2	WATRIS	Code Exception/New Profile ...	There were multiple user sta...	Approved	Jo Deng	2/9/2017 11:53 AM	2/16/2017 12:03 PM
3	SoftCare Service Console	Code Exception	None	Denied	Teh Liu	2/14/2017 2:14 PM	2/14/2017 2:31 PM
4	VA Enterprise Dashboard	Profile change	Through Sprint 31...	Approved	Jonathan Seidler	2/17/2017 12:33 PM	4/7/2017 9:15 AM
5	VA Help Desk App	Code Exception	When User click on Submit L...	Approved	Jaya Dabbara	2/18/2017 5:39 PM	2/23/2017 5:11 PM
6	WATRIS	Code Exception	Multiple user stories	Approved	Priyanka Patelapati	2/21/2017 4:12 PM	2/23/2017 5:11 PM
7	QMS (Quality Management S...	Code Exception	W-001218	Denied	Hari Kalla	2/23/2017 4:40 PM	6/3/2017 11:49 AM
8	QMS (Quality Management S...	Code Exception	Checklist completion	Temp Approved	Hari Kalla	3/15/2017 9:10 AM	6/2/2017 3:09 PM
9	QMS (Quality Management S...	Code Exception	<a href="https://ive-agt-na21.visualfor...">https://ive-agt-na21.visualfor...</a>	Approved	Hari Kalla	3/15/2017 9:17 AM	4/17/2017 7:02 PM
10	QMS (Quality Management S...	Code Exception	W-001273, W-001274, W-00...	Approved	Priyanka Patelapati	3/24/2017 9:03 AM	4/27/2017 9:53 AM
11	QMS (Quality Management S...	Code Exception	W-001300	Temp Approved	Priyanka Patelapati	4/6/2017 11:54 AM	7/3/2017 10:25 AM
12	QMS (Quality Management S...	Code Exception	W-001343	Denied	Priyanka Patelapati	4/7/2017 9:11 AM	4/36/2017 4:16 PM
13	VA Enterprise Dashboard	Code Exception	Controller refactoring	Approved	Jay Miracle	4/31/2017 9:00 PM	5/5/2017 9:50 AM
14	IEWeb	Code Exception	As a Product Owner, I need t...	On Hold	Bradley Hikler	4/17/2017 1:29 PM	5/1/2017 12:15 PM
15	VA Help Desk App	AppExchange App	As A Admin of Salesforce I w...	Approved	Beatrix Zimmerman	4/27/2017 9:12 AM	5/19/2017 9:58 AM
16	VA Enterprise Dashboard	Code Exception	As a monthly edits user I wa...	Approved	Jonathan Seidler	4/28/2017 9:58 AM	7/7/2017 39:05 AM
17	QMS (Quality Management S...	Code Exception	Multiple User stories	Approved	Hari Kalla	5/4/2017 12:41 PM	5/5/2017 30:28 AM
18	VA Enterprise Dashboard	Code Exception	Bulk email capability from th...	Approved	Jay Miracle	5/5/2017 9:50 AM	7/7/2017 30:06 AM
19	WATRIS	Code Exception	Splash Page - <a href="https://ive-agt...">https://ive-agt...</a>	Approved	Bryan BROOME	5/8/2017 12:15 PM	5/31/2017 11:55 AM
20	FOM	Code Exception	Epic Name FOM Document ...	On Hold	Hareesh Chennuru	5/10/2017 9:25 AM	9/15/2017 9:09 AM
21	FOM	New Profile creation request	Epic Name FOM Application	Denied	Hareesh Chennuru	5/10/2017 9:39 AM	7/9/2017 11:00 PM
22	Compliance & Liaison / eforce	Code Exception	Facility Assignment Process	Temp Approved	Bethel Omeike	5/11/2017 11:38 AM	6/2/2017 3:24 PM

# Release/Build Notes (1 of 2)

New for the DTC process!

All teams shall document their changes in the following xls template and upload the xls to a 'Deployments' sub-branch/folder on the development branch. Manual steps shall be tracked here. Copies of these will be placed in VA Production under Application or Exception requests so those without production access (testers) can make use of.

Putting together format and instructions

# Release/Build Notes (2 of 2)

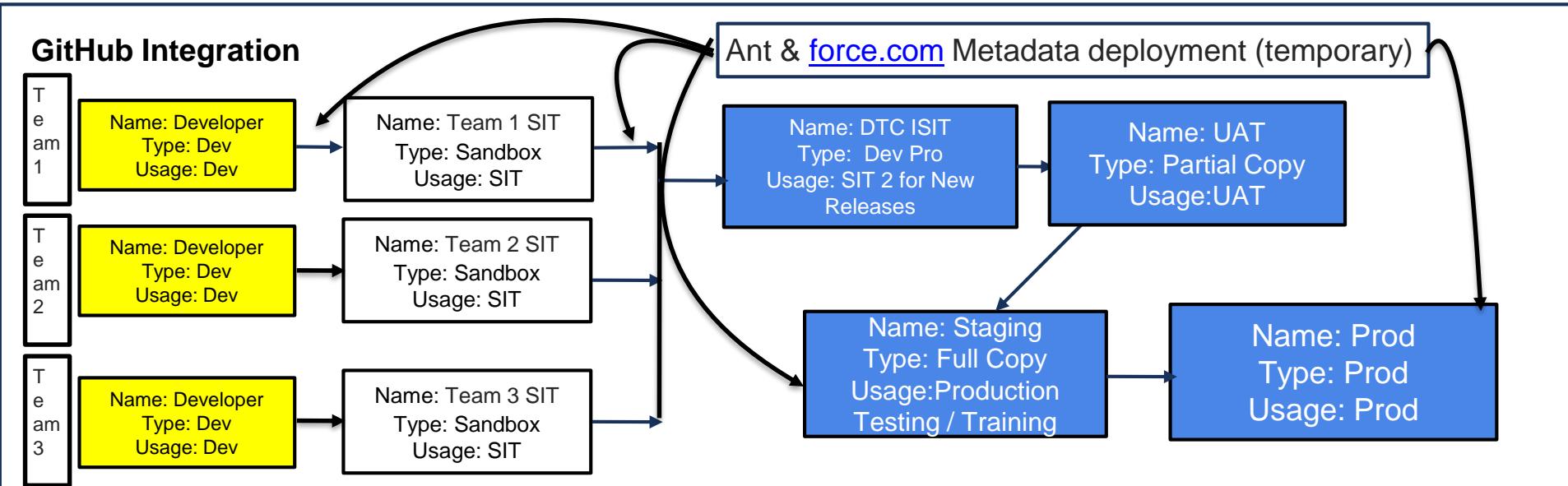
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Deployment Components					
Build Note Owner:	Application Team				
Contact Person:					
Reviewer:	Technical Team / Individual Owners				
Component Name	Component Type	Description	Defect#	Revision#	Owner
HSvc_AccountTransactionResponseHandler.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_AssetAttributesController.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_AssetHierarchyController.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_BlockOutDuringEvent.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_CaseAITriggerHandler.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_ChangeApproverLookupController.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_ChronicAssetConsoleController.cls:	Apex Class	Removed string as a part of cleanup activity	2912	Vineet M.	
HSvc_StaticConstant	Apex Class	Added static constants as a part of cleanup activity	2915	Vineet M.	
HughesSvc_RedirectController	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HSvc_QuickCaseCreateController	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HughesSvc_ExternalInterfaceService	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HSvc_AssetHierarchyCompConsoleController	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HSvc_EventMaintenanceRuleTest	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HSvc_ExpressBackupCasetest	Apex Class	Removed string as a part of cleanup activity	2917	Tanmay	
HSvc_StaticConstants	Apex Class	Added static constants as a part of cleanup activity	2914	Tanmay	
HSvc_ChronicSiteHistoryAccessor	Apex Class	Added static constants as a part of cleanup activity	2913	Richa	
HSvc_ContactAccessor	Apex Class	Added static constants as a part of cleanup activity	2913	Richa	
HSvc_ExcludeAssetFromChronicService	Apex Class	Added static constants as a part of cleanup activity	2913	Richa	
HSvc_RedirectUserOnCaseControllerTest	Apex Class	Added static constants as a part of cleanup activity	2913	Richa	
HSvc_TechnicalCaseTest	Apex Class	Added static constants as a part of cleanup activity	2913	Richa	
HSvc_MarkAssetChronic	Apex Class	Added static constants as a part of cleanup activity	2926	Richa	
HSvc_StaticConstants	Apex Class	Added static constants as a part of cleanup activity	2926	Richa	
HSvc_AccountDetailController	Apex Class	Added static constants as a part of cleanup activity	2926	Richa	
HSvc_CustomSettingAccessor	Apex Class	Added static constants as a part of cleanup activity	2926	Richa	
HSvc_EventCreationForCRcase	Apex Class	Added static constants as a part of cleanup activity	2940	Richa	
HSvc_Event_Time_Body	Label	Remove hard Coding	2939	Richa	
HSvc_Event_Subject	Label	Remove hard Coding	2939	Richa	
HSvc_SplitInstructionsConsoleController	Apex Class	Added static constants as a part of cleanup activity	2926	Richa	
HSvc_Related_To	Label	Remove hard Coding	2939	Richa	
HSvc_Previous_Start_Time	Label	Remove hard Coding	2939	Richa	
HSvc_Previous_End_Time	Label	Remove hard Coding	2939	Richa	

# Flow of Code through the VA DTC Environments

Code must move through SDLC of Dev -> SIT -> SIT 2 -> UAT -> Prod



- Code is only pushed from GitHub
- Ant and shell scripts will be used to automate the deployments and pull from GitHub

**Legend:** 1 - Emergency fixes to Prod Code Base

Individual Developer

Prod Code Base



# Trunks, Branches, and Releases

# Subversion vs GIT: Which is better?

Philosophical Question. Both have their advantages and disadvantages. Given the various developers/SI's that come in/out of VA, GIT makes the best sense in providing reliability, flexibility and scalability.

## Subversion

- Centralized Repository
- Must be connected to Repository
- Simpler to learn, and simplified checkout/lock
- Simpler to standardize processes

## GIT

- Decentralized / Distributed
- Can work on local repository (does not need to be connected)
- Harder to learn. Added complexities around commands locally vs when connected, and managing changes/merges among developers.
- Flexible, but means there's more than one way to do something
- Faster than Subversion due to decentralization
- Branching is easier

## Decision:

Go with GitHub for now as we build a foundation moving us towards a true CI (continuous integration) environment.



# Trunks, Branches, and Releases: Git

# Main Branches

Three main branches with an infinite lifetime:

- Master (Trunk)
- Release (for all teams within a specific release)
- Develop (for each team to perform development during a sprint)

Master to be the main branch where the source code of HEAD always reflects a production-ready state

Release to be the main branch where the source code of HEAD always reflects a state with the latest delivered development changes for the current release

Develop to be the main branch where the source code of HEAD always reflects a state with the latest delivered development changes for the each team

When the source code in the develop branch reaches a stable point and is ready to be deployed to environments above dev, all of the changes should be merged back into the release branch and then tagged with a release number.

The release branch will remain viable until it has passed UAT and is ready to be deployed to production. At that point, the release branch will be merged into the master branch.

Each time when changes are merged back into master, this is a new production release by definition. Ultimate Goal is to automatically build and roll-out software to our production servers everytime there was a commit on master.

# Support Branches

The different types of branches we will use are:

- Feature branches
- Release branches
- Hotfix branches

Each of these branches have a specific purpose and are bound to strict rules as to which branches may be their originating branch and which branches must be their merge targets.

By no means are these branches “special” from a technical perspective. The branch types are categorized by how we use them. They are of course plain old branches.

# Feature Branches (Prototypes)

May branch off from:

- Develop

Must merge back into:

- Develop

Branch naming convention:

- anything except master, develop-<team>-<application>\*, release-<release #>, or hotfix-<team>-<application>\*

Feature branches (or sometimes called topic branches) are used to develop new features for the upcoming or a distant future release. When starting development of a feature, the target release in which this feature will be incorporated may well be unknown at that point. The essence of a feature branch is that it exists as long as the feature is in development, but will eventually be merged back into develop (to definitely add the new feature to the upcoming release) or discarded (in case of a disappointing experiment).

# Release Branches

May branch off from:

- master

Must merge back into:

- master

Branch naming convention:

- release-<release #>

Release branch supports preparation of a new production release a.k.a TSIT/UAT/Staging. By doing all of this work on a release branch, the develop branch is cleared to receive features for the next big release.

The key moment to branch off a new release branch from master is at the start of a new release. Once the release branch is created for all teams, a develop branch will be created to support individual team development.

It is exactly at the start of a release branch that the upcoming release is moved into Test Phase. Up until that moment, the develop branch reflects changes for the upcoming release.

When the state of the release branch is ready to become a real release, some actions need to be carried out

- First, the release branch is merged into master (since every commit on master is a new release by definition)
- Next, that commit on master must be tagged
- Finally, the changes made on the release branch need to be merged back into develop, so that future releases also contain these bug fixes.
- Once merged into production this release branch is CLOSED

A New Release Branch is Created for Each New Major Release

# Hotfix Branches

May branch off from:

- Master

Must merge back into:

- Master, Release, (Develop)

Branch naming convention:

- hotfix-<team>-<application>\*

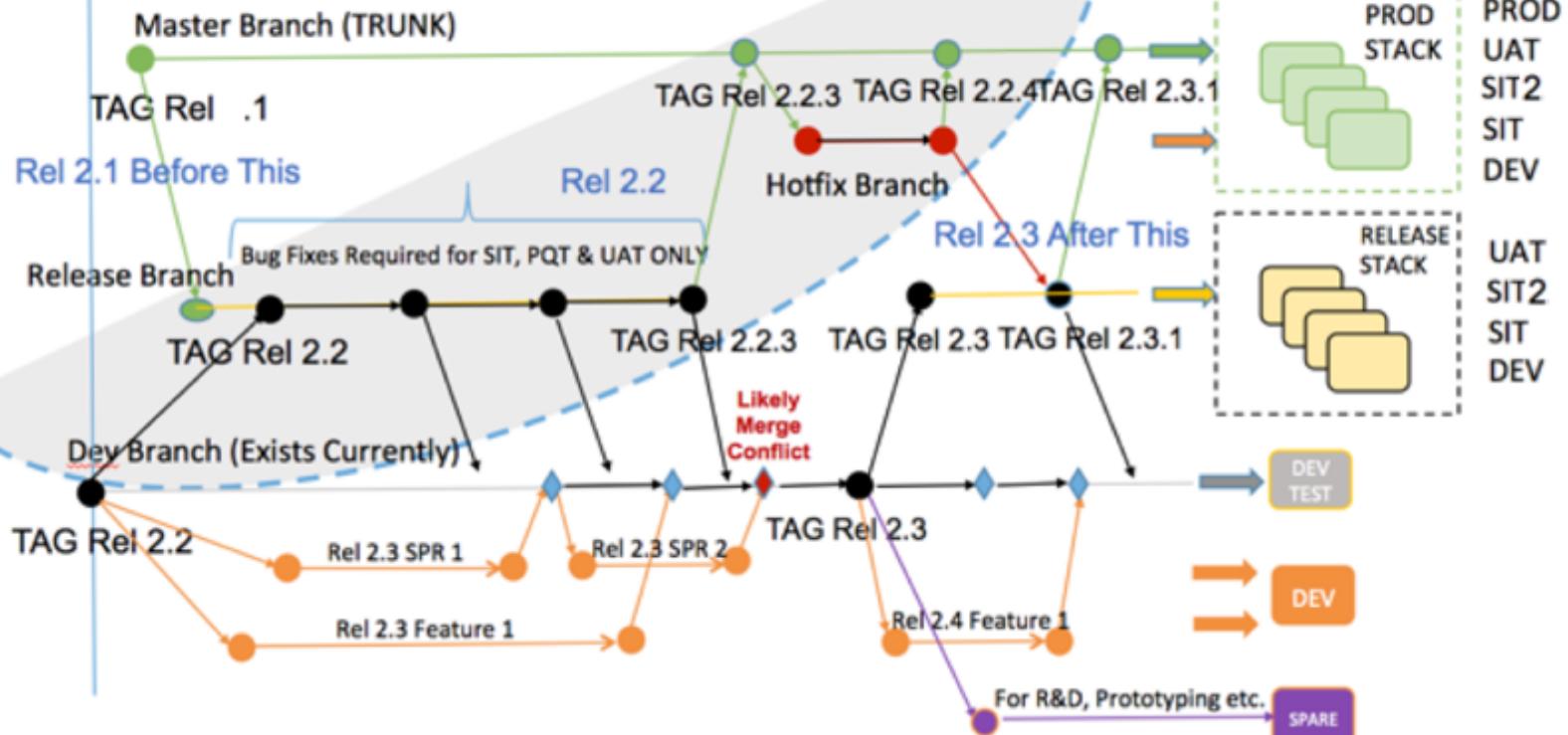
Hotfix branches are very much like release branches in that they are also meant to prepare for a new production release, albeit unplanned. They arise from the necessity to act immediately upon an undesired state of a live production version. When a critical bug in a production version must be resolved immediately, a hotfix branch may be branched off from the corresponding tag on the master branch that marks the production version. The essence is that work of team members (on the develop branch) can continue, while another person is preparing a quick production fix.

When finished, the bugfix needs to be merged back into master, but also needs to be merged back into release branch, in order to safeguard that the bugfix is included in the next release as well. Back-merging the bugfix into the release branch will eventually result in the bugfix being merged into develop too, when the release branch is CLOSED. If a release branch currently does NOT exists, the hotfix changes need to be merged into the develop branch. (If work in develop immediately requires this bugfix and cannot wait for the release branch to be finished, you may safely merge the bugfix into develop now already as well.)

# Trunks and Branches

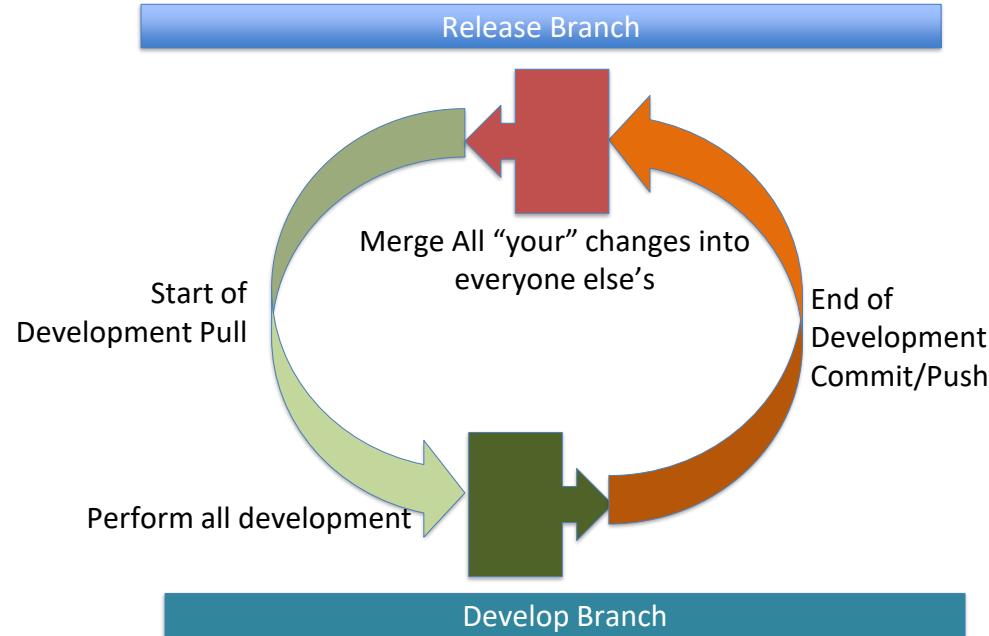
8/11

TIME

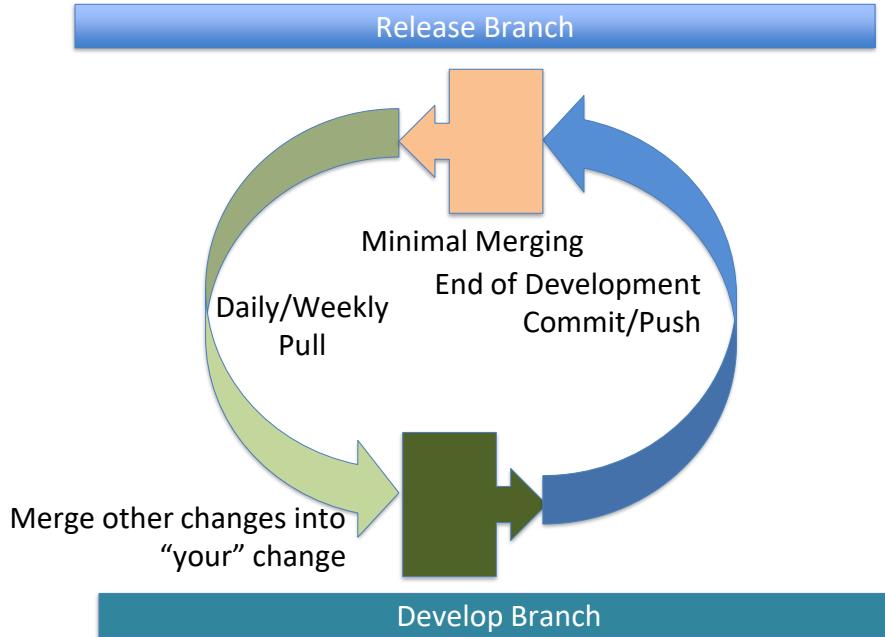


# Usual Pull/Push/Merge Process

Might appear the most logical



# Best Pull/Push/Merge Process





# What Type of Developer are YOU?

# Developer Profiles

## Developers

Developer Scenario 1



Developer Scenario 2



Developer Scenario 3



## Developer Team

No Extended Development Team

SIT Optional  
No CLI Access

Development Team Exists

SIT Exists  
Developers use Git CLI

Development Team Exists

SIT Exists  
Developers use Eclipse or Git CLI

Salesforce  
DEV/SIT



GitHub  
Repository

Salesforce  
DEV/SIT



GitHub  
Repository

Salesforce  
DEV/SIT



GitHub  
Repository

## DTC Team

DTC Performs Git & All Deployments  
SIT->Production

DTC Performs Deployments  
ISIT->Production

DTC Performs Deployments  
ISIT->Production



# Developer Profile for Developer Scenario 1

Individual developer(s), no extended team, no SIT for testing, only uses SF UI & developer console

## Developer

### Setup

- No additional setup

### Activities

- Uses SF UI and/or developer console
- Does not have a SIT box

## Development Team

No extended development team – no activities here

## DTC Deployment team Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each team/sandbox

### Activities

- DTC script to perform Git pull and Merge
- DTC script to export changes from SF
- DTC script to push changes to GitHub
- Perform GitHub merging with developer(s)
- For SIT/pull GitHub repo and deploy



# Developer Profile for Developer Scenario 2

Individual developer(s), has an extended team, uses SIT for testing, uses SF UI & developer console & Git CLI

## Developer

### Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each team/sandbox

### Activities

- Uses SF UI and/or developer console
- Uses DTC deployment scripts for extract, Git pull, Git merge, Git push

## Development Team

If there isn't a Team Development Coordinator-no activities here

### Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each sandbox

### Activities

- DTC script to perform Git pull and Merge
- DTC script to export changes from SF
- DTC script to push changes to GitHub
- Perform GitHub merging with developer(s)
- For SIT/pull GitHub repo and deploy

## DTC Deployment team Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each team/sandbox

### Activities

- DTC script to perform Git pull and Merge
- DTC script to export changes from SF
- DTC script to push changes to GitHub
- Perform GitHub merging with developer(s)



# Developer Profile for Developer Scenario 3

Individual developer(s), has an extended team, uses SIT for testing, uses SF UI & Eclipse IDE & eGit for development

## Developer Setup

(see next section on Development Tools)

- Install and configure Eclipse & SF Plugin
- Install and configure eGit

## Activities

- Uses SF UI
- Uses Eclipse SF IDE Plugin
- Uses eGit Plugin for all GitHub interaction

## Development Team

If there isn't a Team Development Coordinator-no activities here

## Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each sandbox

## Activities

- DTC script to perform Git pull and Merge
- DTC script to export changes from SF
- DTC script to push changes to GitHub
- Perform GitHub merging with developer(s)
- For SIT/pull GitHub repo and deploy

## DTC Deployment team Setup

(see next section on Development Tools)

- Install and configure GIT CLI
- Install and configure Ant
- Install and configure Force.com Migration Tool
- Configure build.xml, build.properties, & package.xml for each team/sandbox

## Activities

- DTC script to perform Git pull and Merge
- DTC script to export changes from SF
- DTC script to push changes to GitHub
- Perform GitHub merging with developer(s)





# Development Tools

# Problem Statement: Development Tools

Currently, there isn't a published standard for development tools. Which ones are recommended and which versions are known to work the best? Also, there isn't an official procedure for automating the build and deploy processes via Any or some other tool.

## Impacts:

- Without the use of GitHub plug-in, code is not being checked-out. This can lead to multiple developers updating the same file, with no source of truth
- Without the use of Ant, code migrations are not being done in a consistent format.

## Proposed Resolution:

- All developers should use Eclipse with the Force.com IDE and GitHub plug-in (eGit)
- Only those responsible for migration need to have Ant installed on their machine
  - Long-term, a Migration Server with Ant installed or Jenkins should be used for all migrations

# Developer Workstation

All developers and admins shall have the following developer workstation setup:



- A supported operating system
  - Windows 7, 8, or 10
  - macOS 10.7, 10.8, 10.9, 10.10, or 10.11
  - Ubuntu 12.04 LTS or 14.04 LTS
- Java SE Development Kit (JDK), Runtime Environment 8, or later
- Eclipse Mars or Neon
  - The Eclipse IDE for Java Developers distribution is recommended
- Eclipse plug-in for GIT (eGit)

\* Sublime (Text Editor) and MavensMate (Open Source for Force.com IDE) is another popular option, but is not the official standard in the Salesforce link above. Sublime costs \$50-70/license, and Sublime GIT plugin cost \$16/user

# Tool Versions (1 of 2)

All developers and admins shall have the following developer workstation setup:

Tool	Version	Who	Install Location
Force.com IDE	Eclipse46 Neon	Developer	Within Eclipse, point to the following URL(links to download Java and Eclipse Neon 3): <a href="https://developer.salesforce.com/docs/atlas.en-us.eclipse.meta/eclipse/ide_install.htm">https://developer.salesforce.com/docs/atlas.en-us.eclipse.meta/eclipse/ide_install.htm</a>
eGit	4.9.x	Developer	Within Eclipse, point to the following URL: <a href="http://download.eclipse.org/egit/updates">http://download.eclipse.org/egit/updates</a>
Git CLI	v41	Developer	Download and install from git: <a href="https://git-scm.com/downloads">https://git-scm.com/downloads</a>
Ant & Force.com Ant Migration Tool	v41	Admin	Any Salesforce Org: Setup -> Build -> Develop -> Tools v41: —OR— <a href="https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/forcemigrationtool_install.htm">https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/forcemigrationtool_install.htm</a>
SOAP UI	5.3.x	Integration Developer	<a href="https://www.soapui.org/downloads/soapui.html">https://www.soapui.org/downloads/soapui.html</a>

# Tool Versions (2 of 2)

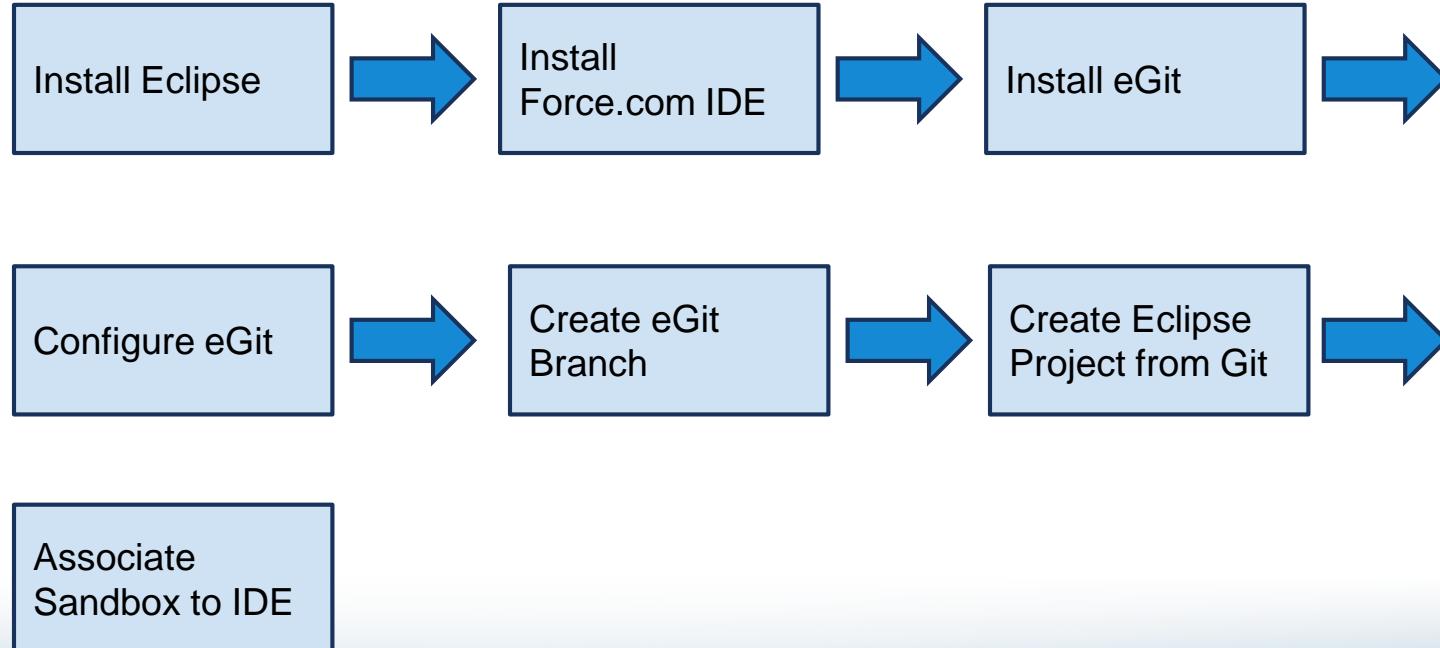
All developers and admins shall have the following developer workstation setup:

Tool	Version	Who	Install Location
Apex Data Loader	V36	Integration Developer	Any Salesforce Org: Setup -> Administration Setup -> Data Management -> Data Loader v34: <a href="https://developer.salesforce.com/page/Data_Loader">https://developer.salesforce.com/page/Data_Loader</a>
Force.com Explorer	0.58A Beta	Integration Developer	Any Salesforce Org: Setup -> Build -> Develop -> Tools 0.58A Beta: <a href="https://developer.salesforce.com/page/ForceExplorer">https://developer.salesforce.com/page/ForceExplorer</a>



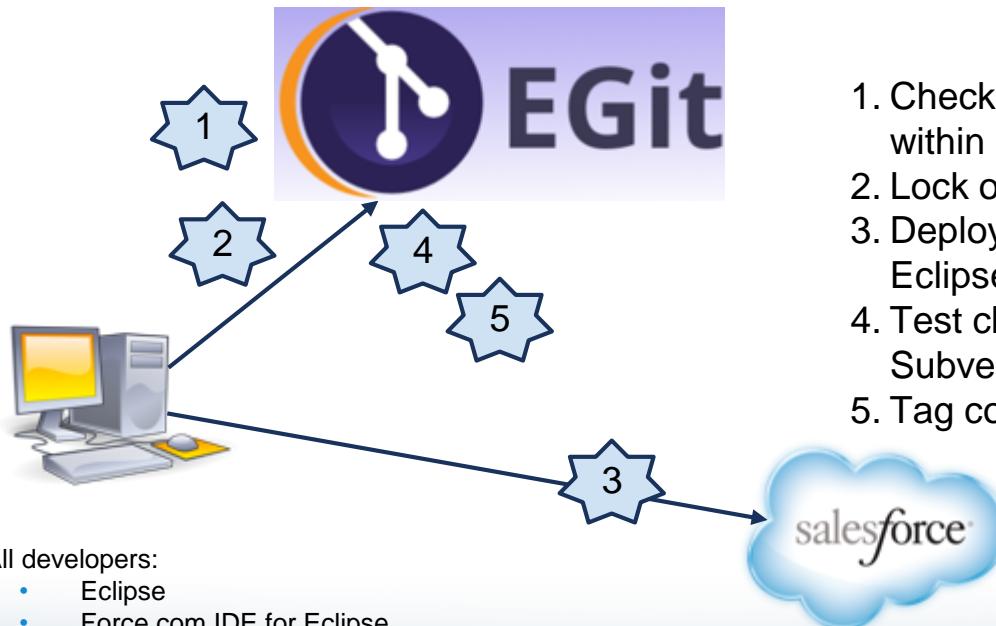
# Development Process: Force.com (Eclipse) IDE & Git

# Development IDE Install Steps



# Development Process

All developers shall checkout code from eGit, develop locally, then save back to eGit



1. Checkout project/branch from Git using eGit plug-in within Eclipse
2. Lock objects/files to be modified
3. Deploy code to Dev Sandbox via Force.com IDE for Eclipse
4. Test changes, and commit/unlock changes back to Subversion
5. Tag code to applicable code drop or Release

# Work Instructions: Install Eclipse

## Who:

- Developers

## Steps:

- Download Eclipse Neon 4.6
- Follow and accept all the prompts
- Full details can be found at  
<https://www.eclipse.org/downloads/packages/eclipse-ide-java-ee-developers/neon3>

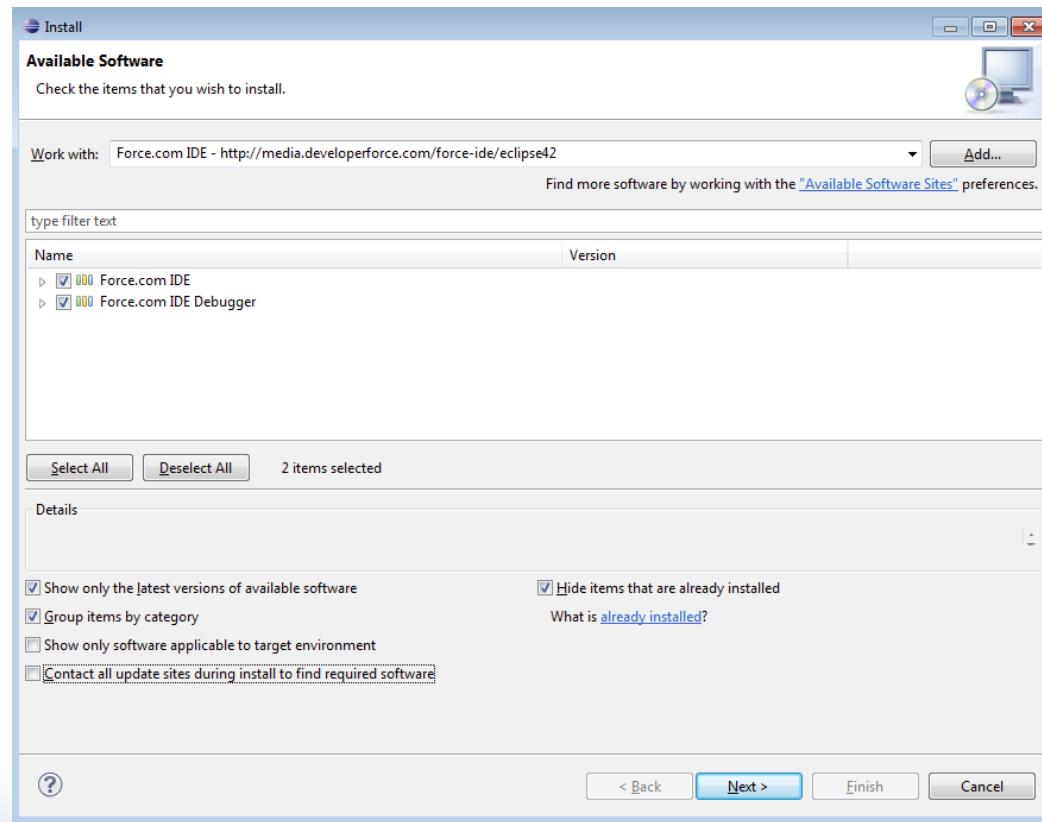
# Work Instructions: Install Force.com IDE

## Who:

- Developers

## Steps:

- In Eclipse, go to Help -> Install New Software
- Click Add and put in the URL:  
<https://developer.salesforce.com/media/force-ide/eclipse45>
- Check both Force.com IDE and Force.com IDE Debugger
- Follow and accept all the prompts
- Full details can be found at  
[https://developer.salesforce.com/page/Force.com\\_IDE\\_Installation](https://developer.salesforce.com/page/Force.com_IDE_Installation)



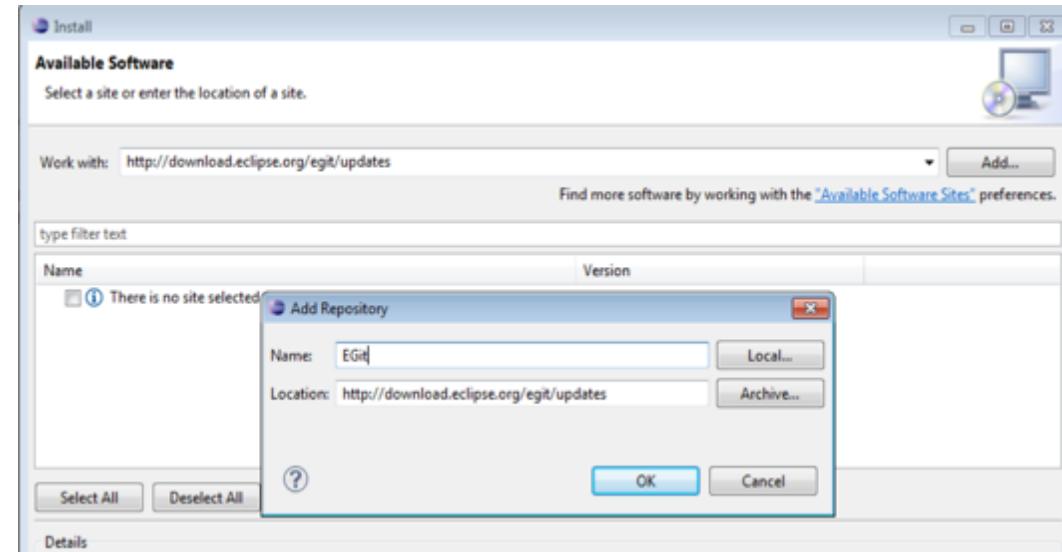
# Work Instructions: Install eGit

## Who:

- Developers

## Steps:

- In Eclipse, go to Help -> Install New Software
- Click Add and put in the URL:  
<http://download.eclipse.org/egit/updates>
- Check all the items – Eclipse Git Team Provider, Eclipse Git Team Provider – experimental features, and eGit
- Follow and accept all the prompts
- Full details can be found at  
<http://www.eclipse.org/egit/download/>



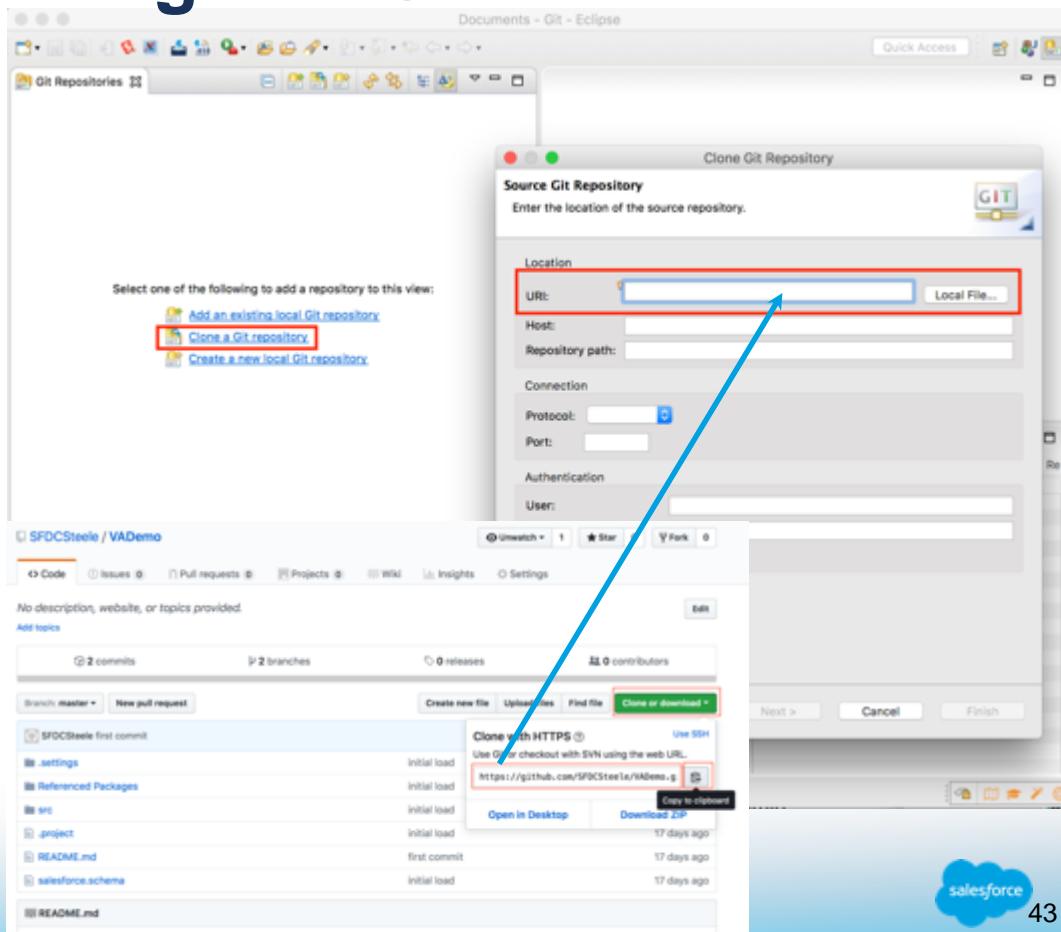
# Work Instructions: Configure eGit

## Who:

- Developers

## Steps:

- In Eclipse, go to Window -> Open Perspective -> Other
- Select 'Git' and click OK
- Accept all other defaults and click Finish
- Click the 'Clone Git Repository' link and put in the URI provided by your admin
- Place URI from GitHub session **\*once provided\***
- Accept all other defaults and click Finish



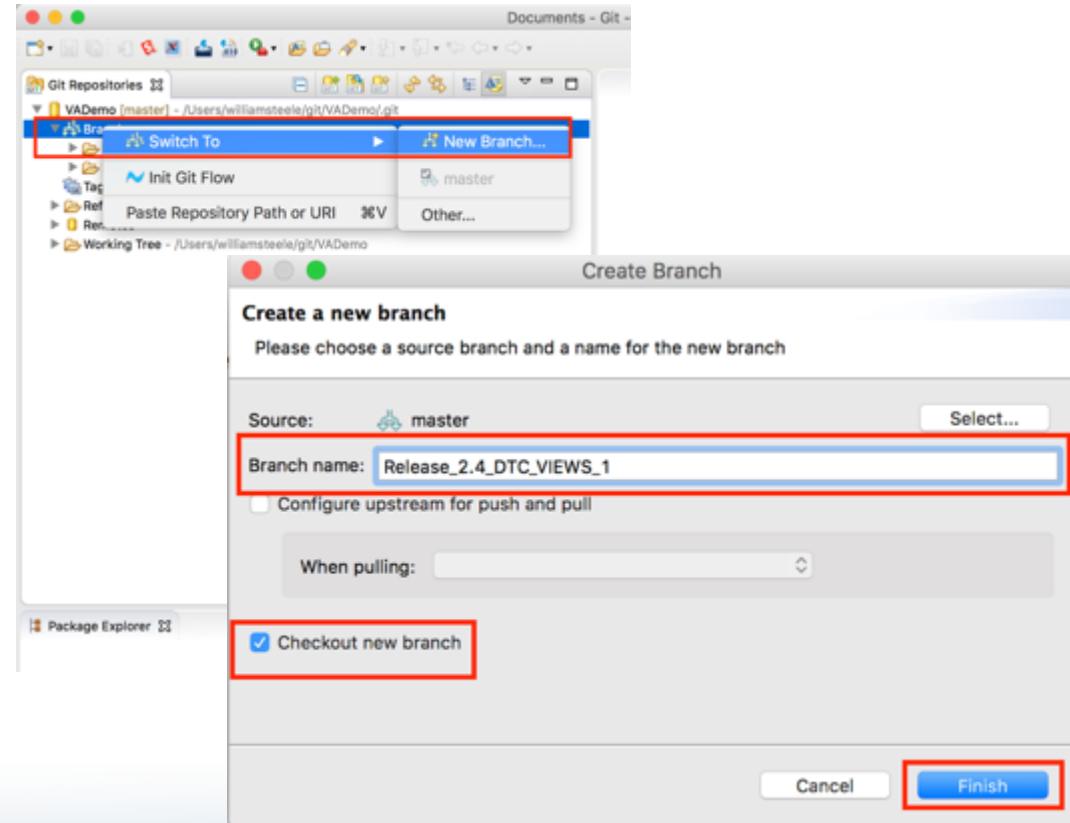
# Work Instructions: Create Git Branch to work on

## Who:

- Developers

## Steps:

- Right click the project, and go to Switch To -> New Branch
- Give the Branch a name, i.e. "Release\_2.4\_DTC\_VIEWS\_1"
- Leave the 'Checkout new branch' checked
- Click Finish



\*\*\*Branch name standards will be provided later

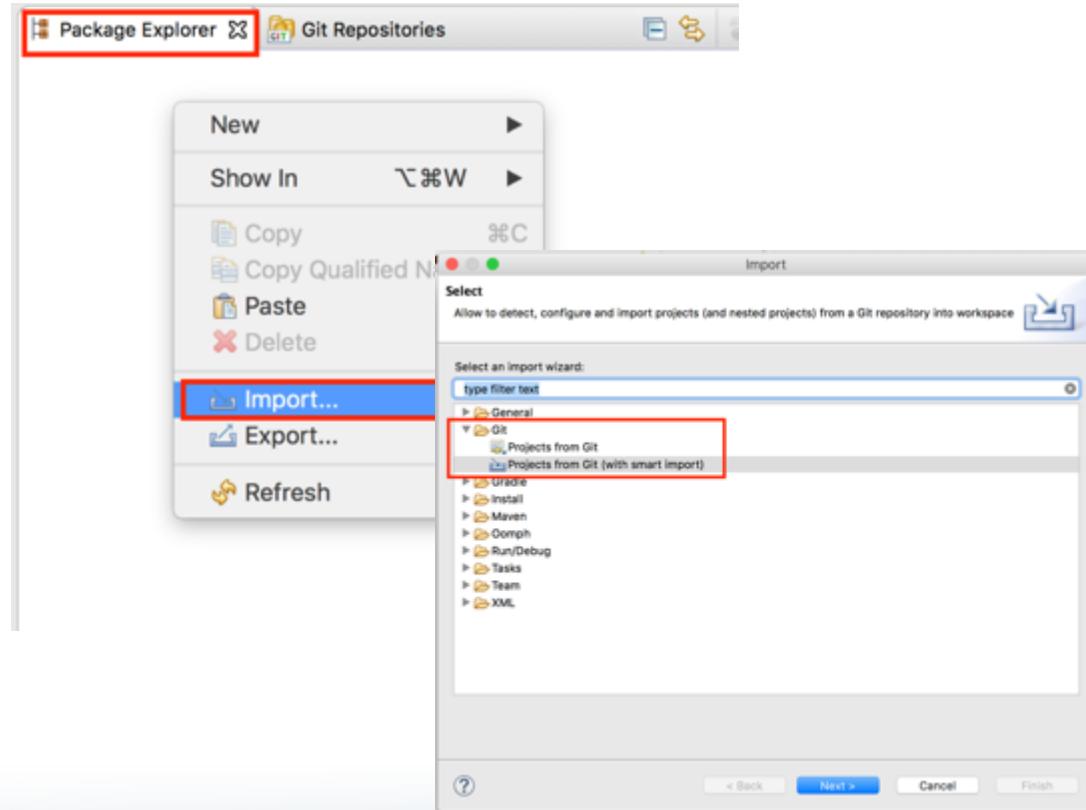
# Work Instructions: Create Eclipse Project from GIT (1 of 3)

## Who:

- Developers

## Steps:

- In Package Explorer, right click and click on 'Import'
- Select 'Projects from Git (either option)



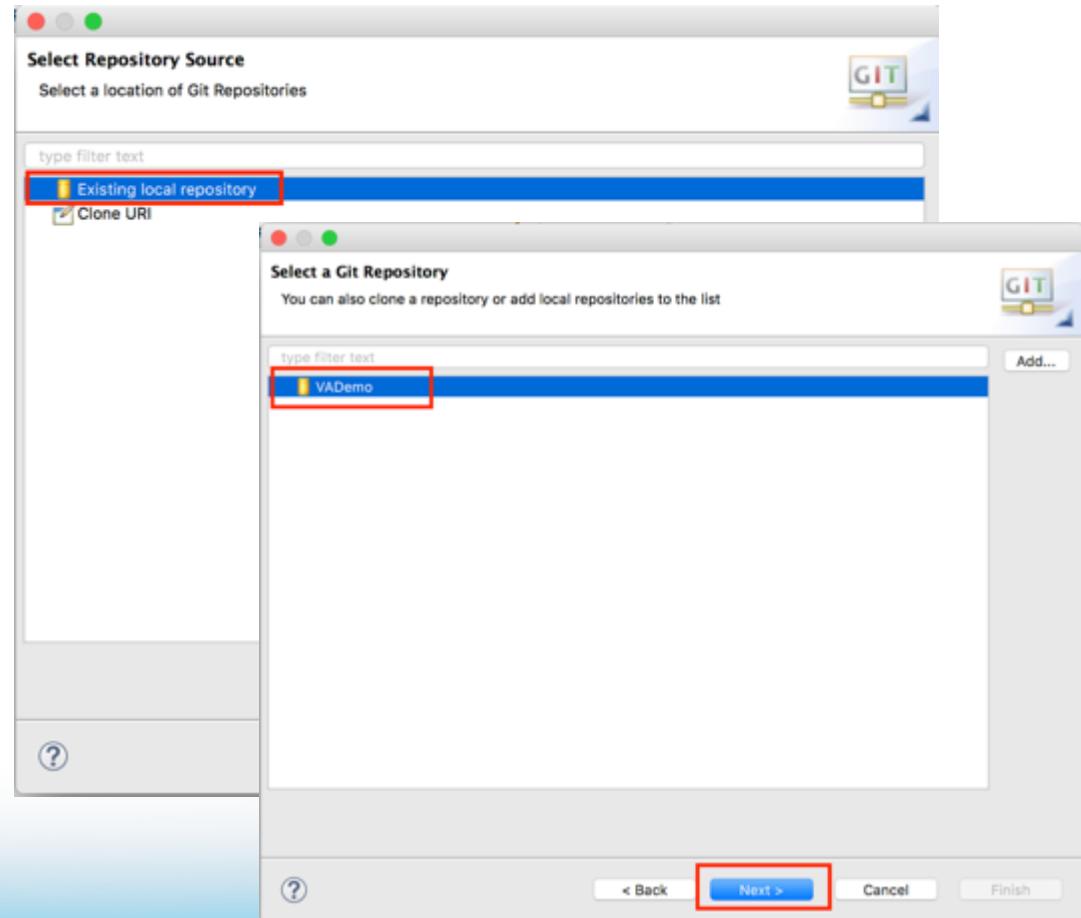
# Work Instructions: Create Eclipse Project from GIT (2 of 3)

## Who:

- Developers

## Steps:

- Select 'Existing local repository'
- Select the GIT repository that was added earlier



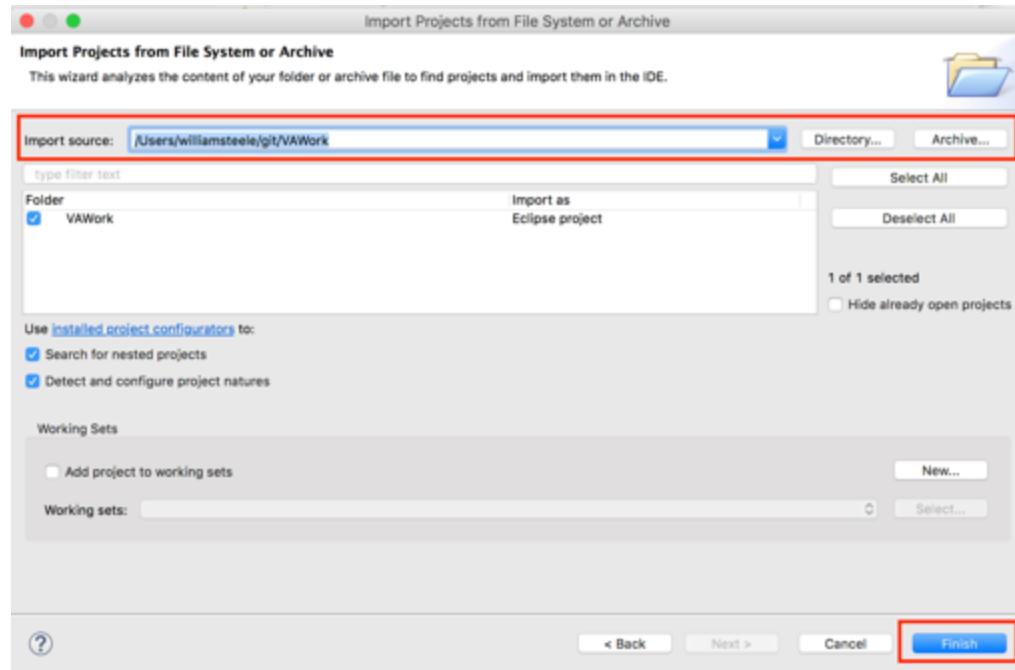
# Work Instructions: Create Eclipse Project from GIT (3 of 3)

## Who:

- Developers

## Steps:

- Ensure “Import Source” is correct
- Validate other options and click Finish



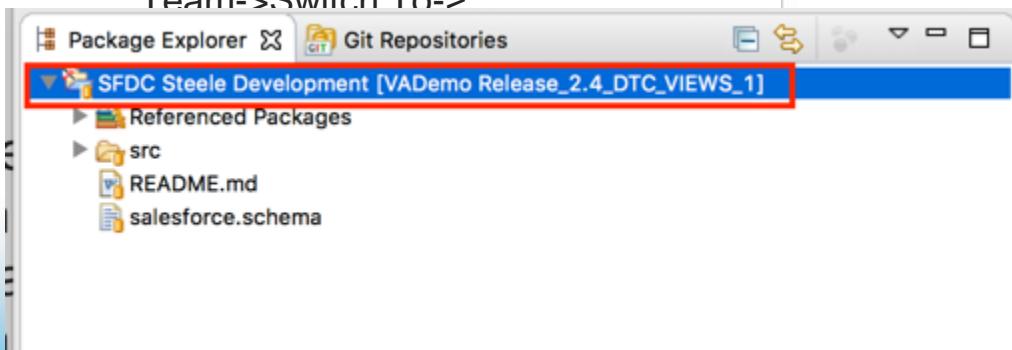
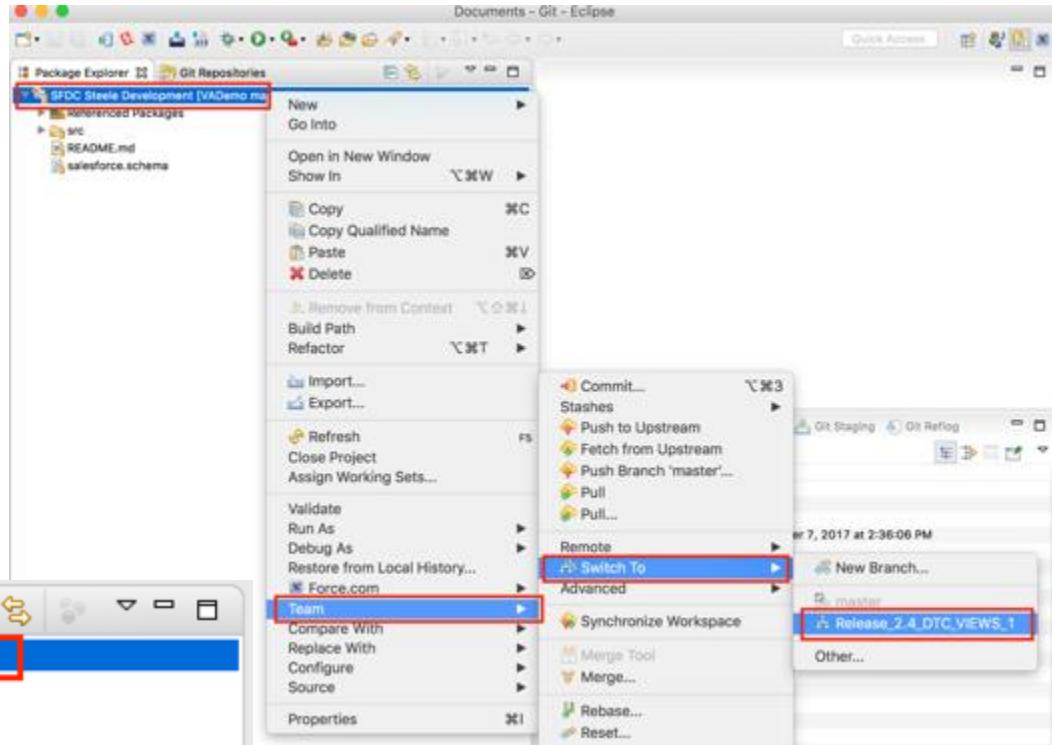
# Work Instructions: Switch to Specific Branch for Development

## Who:

- Developers

## Steps:

- View in the brackets whether you're on the master branch (VADemo master) or a child branch created earlier (VADemo Relase\_2.4\_DTC\_VIEWS\_1)
- To switch to child branch to develop, right click the project, and navigate to Team->Switch To->



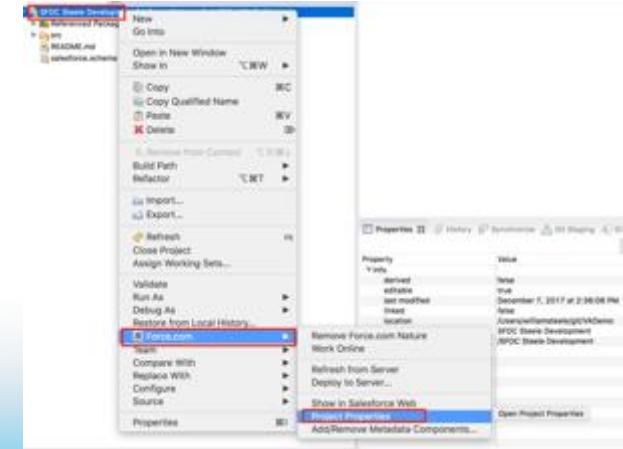
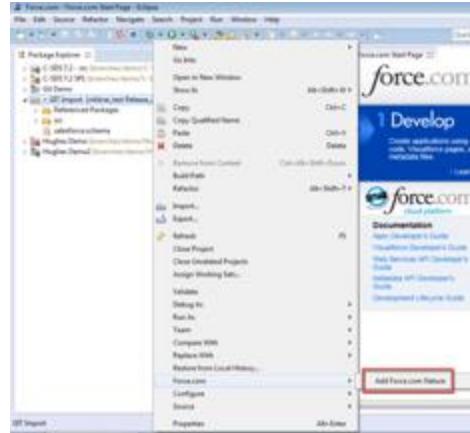
# Work Instructions: Associate Sandbox to IDE (1 of 2)

## Who:

- Developers

## Steps:

- Right click project, and navigate to Force.com->Add Force.com Nature (if not already added)
- Right click project, and navigate to Force.com-> Project Properties



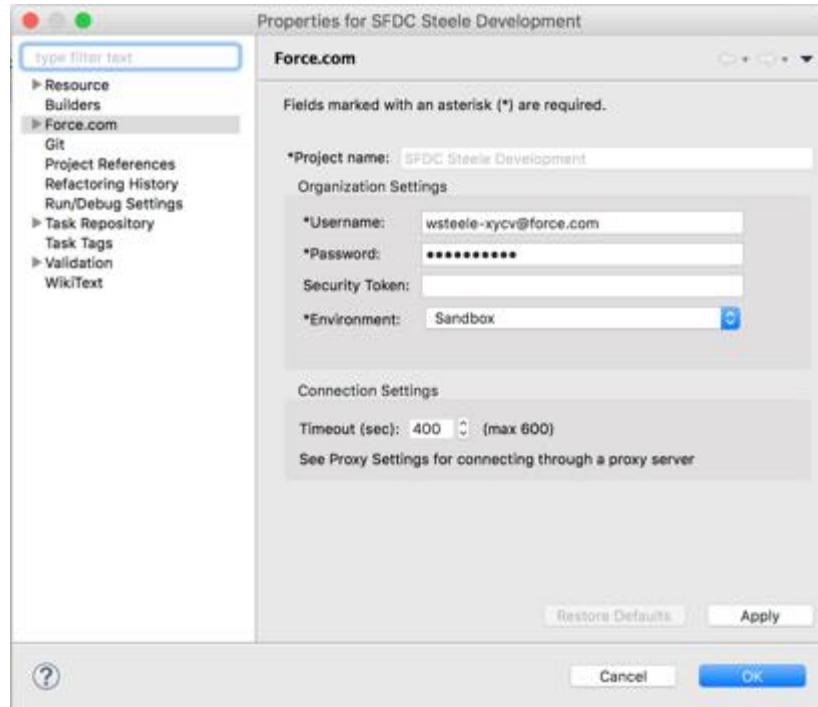
# Work Instructions: Associate Sandbox to IDE (2 of 2)

## Who:

- Developers

## Steps:

- Enter the appropriate username, password, and environment and click OK
- If prompted, do not overwrite



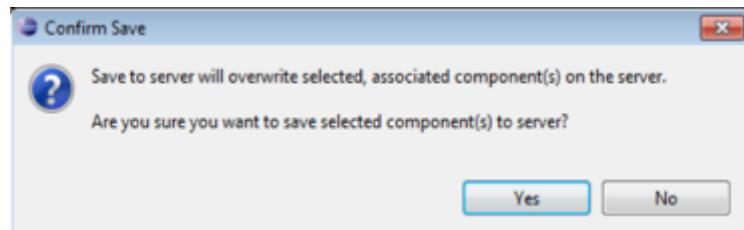
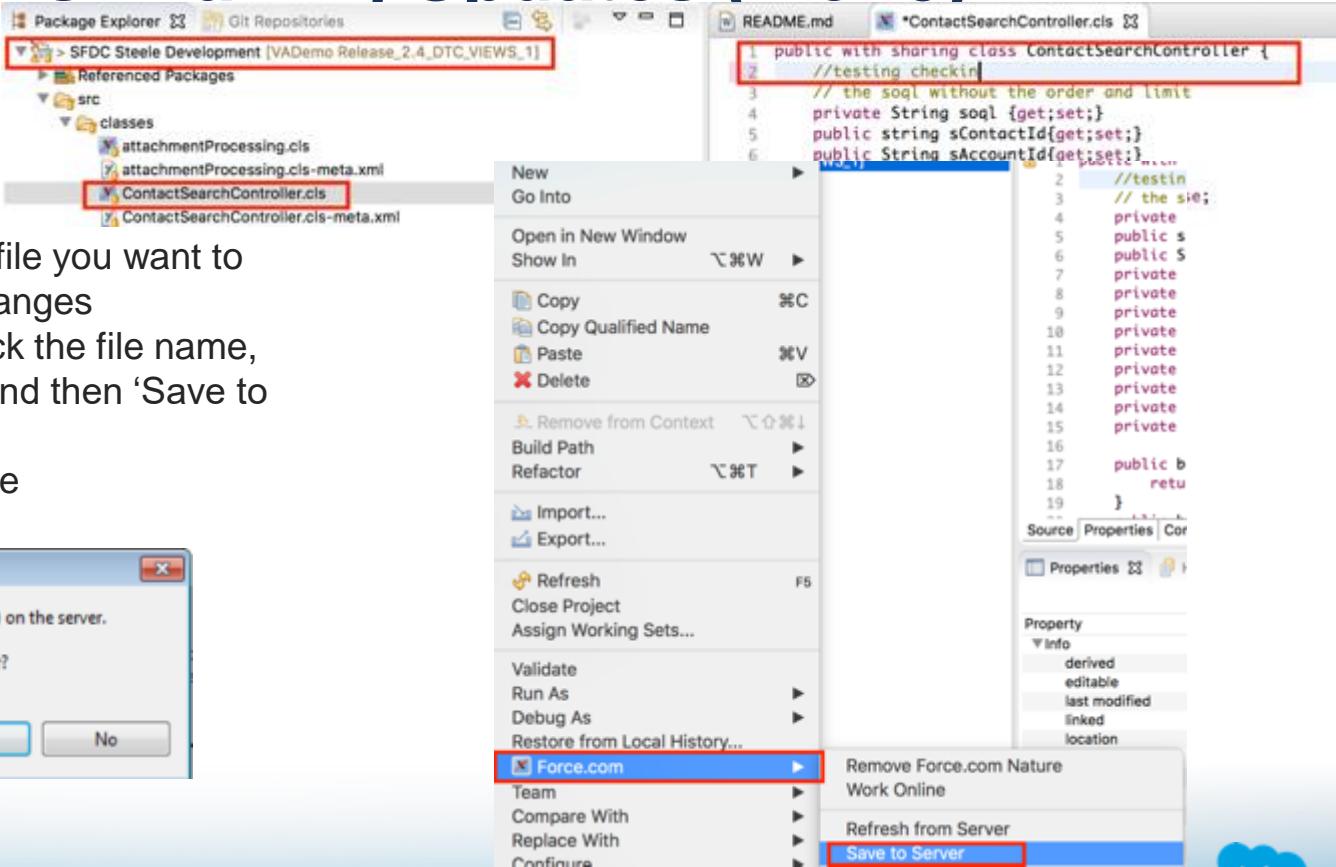
# Work Instructions: Making Updates (1 of 3)

## Who:

- Developers

## Steps:

- In Eclipse, open the file you want to modify and make changes
- When done, right click the file name, select 'Force.com', and then 'Save to Server'
- Confirm the Overwrite



# Work Instructions: Making Updates (2 of 3)

## Steps:

- Validate that the changes have been sync'ed to the Sandbox Env
- Perform testing as needed
- Create/update code coverage scripts

Apex Class  
ContactSearchController

\* Back to List: Static Resources

Apex Class Detail

Name ContactSearchController

Namespace Prefix

Created By William Steele , 6/20/2017 6:45 AM

Edit Delete Do

Class Body Class Summary Version Settings Trace Flags

```
1 public with sharing class ContactSearchController {  
2 //testing checkin  
3 // the soql without the order and limit  
4 private String soql {get;set;}  
5 public string sContactId{get;set;}  
6 public String sAccountId{get;set;}  
7 private boolean isTest=false;  
8 private boolean duplicateContact = false;  
9 private boolean foundContact = false;  
10 private boolean savedContact = false;  
11 private boolean createdQuote = false;  
12 private boolean ssnSearch = false;  
13 private String ssnSearchValue = " ";  
14 private boolean birthDateSearch = false;  
15 private String birthDateSearchValue = " ";  
16  
17 public boolean contactDuplicate () {  
18     return duplicateContact;  
19 }
```

# Work Instructions: Making Updates (3 of 3)

## Steps:

- Alternatively, some items are easier to update in Salesforce GUI than in Eclipse, such as Workflows, Validation Rules. In this instance:
  - Lock the respective object via Eclipse (i.e. lock the Account object to make Account workflow or validation rule changes)
  - Make changes in Salesforce GUI
  - Once done, go to Eclipse, right click the object, and go to Force.com->'Refresh from Server'
  - Right click file, and go to Team->Commit

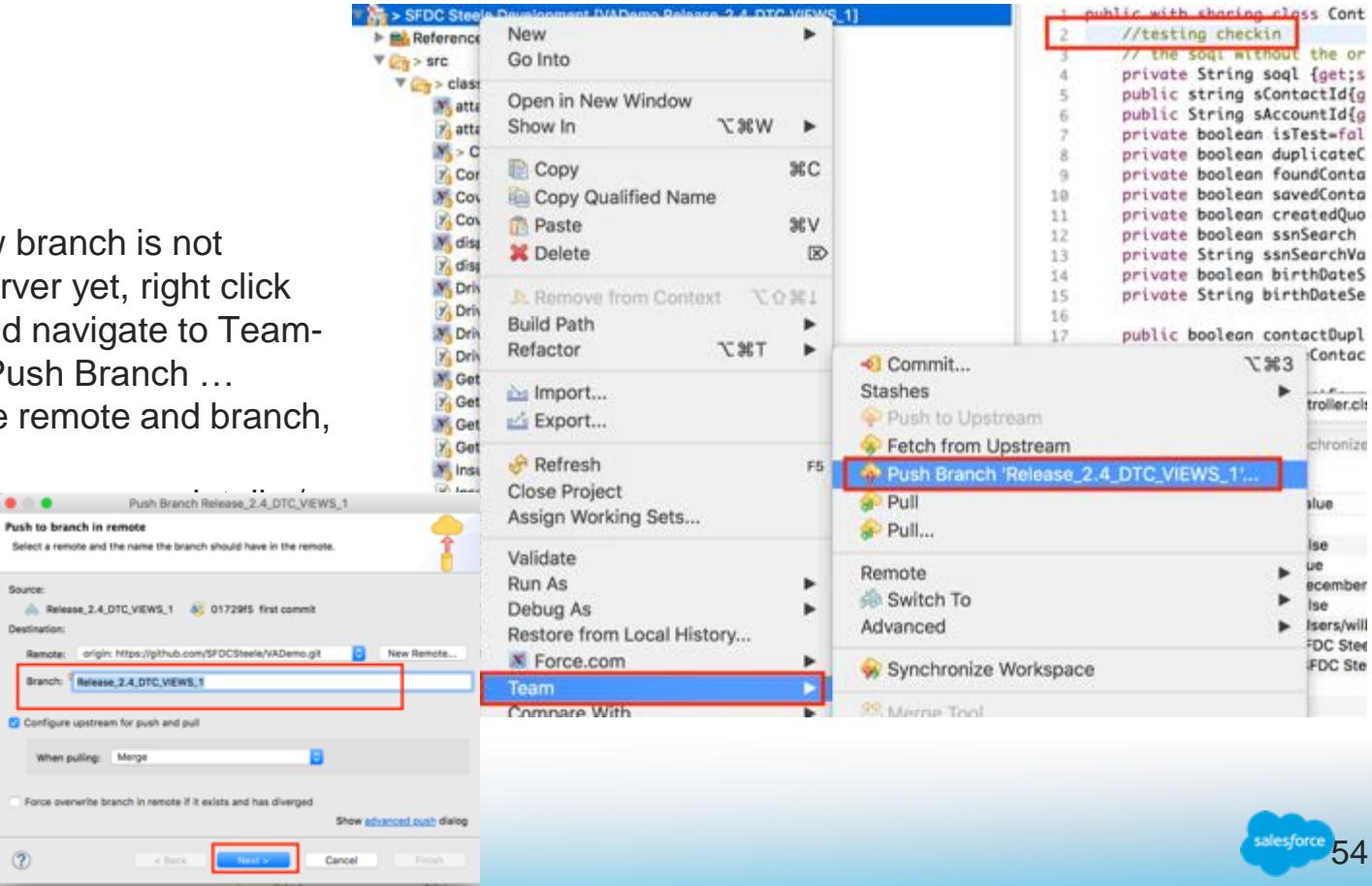
# Work Instructions: Commit and Push to Server – Branch Update Only (1 of 3)

## Who:

- Developers

## Steps:

- In Eclipse, if new branch is not synced to Git Server yet, right click the file name, and navigate to Team-> Repository-> Push Branch ...
- Select applicable remote and branch, etc
- Enter appropriate comments
- Click Finish



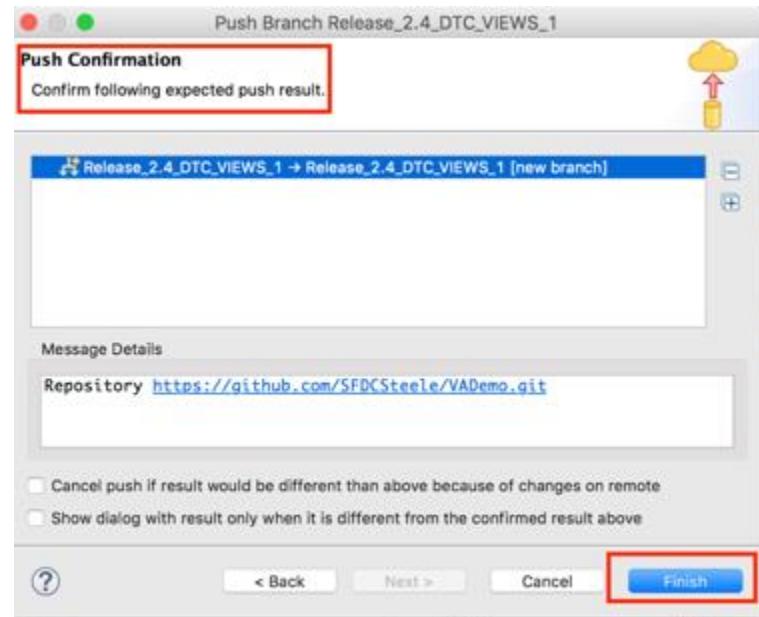
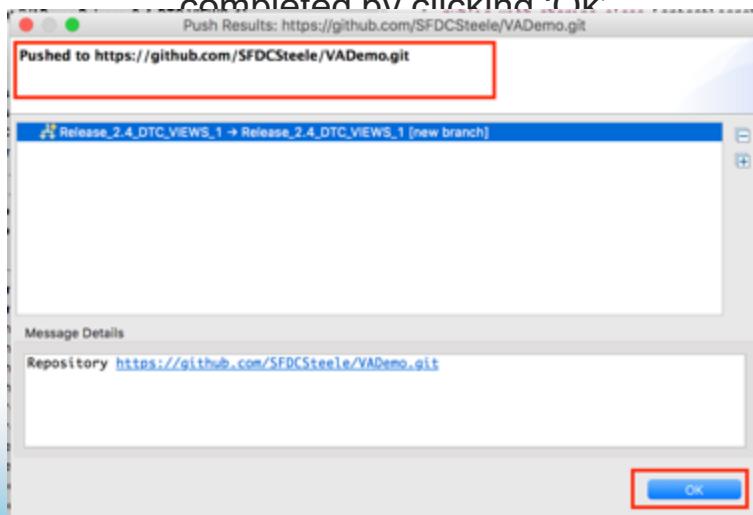
# Work Instructions: Commit and Push to Server - Branch Update Only (2 of 3)

## Who:

- Developers

## Steps:

- Finalize/confirm the push by clicking 'Finish'
- Acknowledge the push has completed by clicking 'Ok'



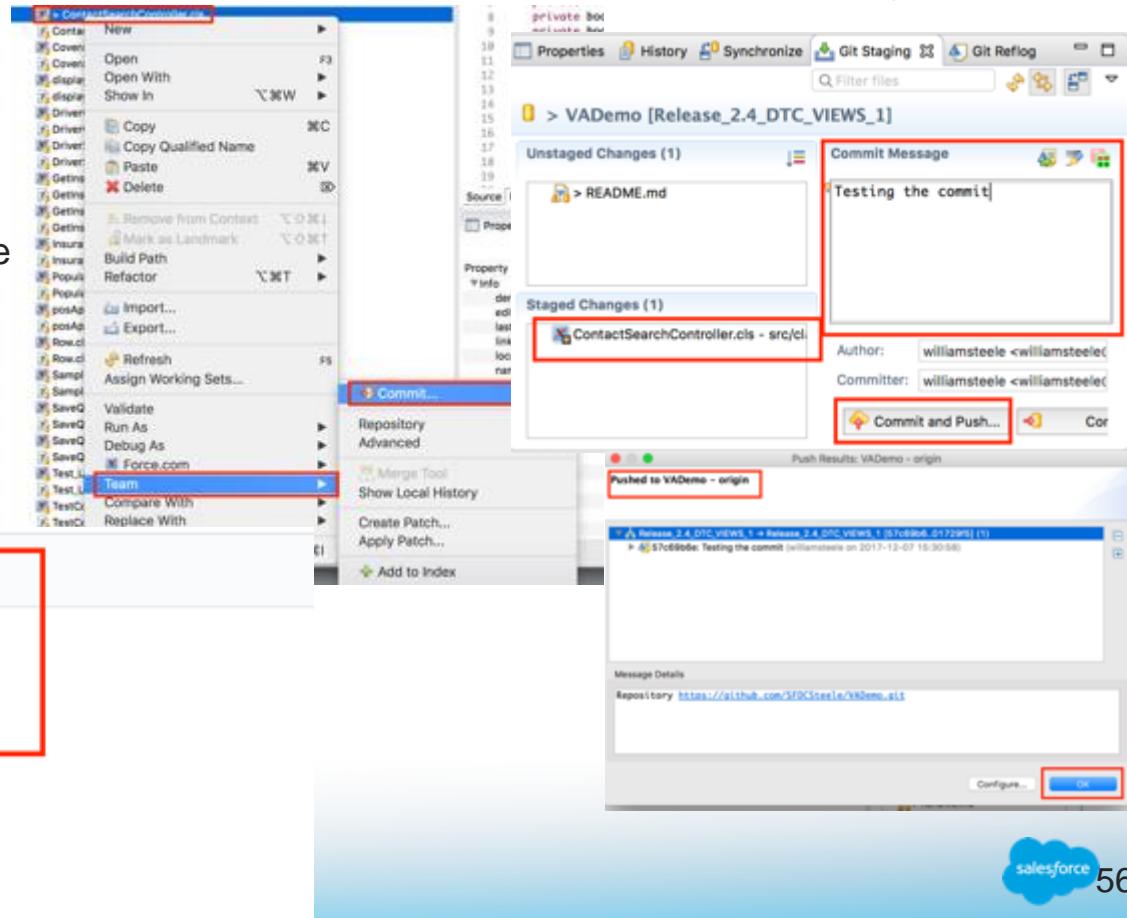
# Work Instructions: Commit and Push to Server - Branch Update Only (3 of 3)

## Who:

- Developers

## Steps:

- In Eclipse, right click the file name and navigate to Team-> Commit
- Add Commit Comments
- Click on 'Commit and Push'
- Verify that update has been uploaded



# Work Instructions: Sync to Main Branch

## - Pull Request (1 of 3)

### Who:

- Developers or Team Development Coordinator

### Steps:

- On browser, navigate to applicable GitHub URL
- Click on 'Compare & pull request' button

The screenshot shows a GitHub repository page for 'SFDCSteele / VADemo'. At the top, there are navigation links for Code, Issues (0), Pull requests (0), Projects (0), Wiki, Insights, and Settings. Below the header, it says 'No description, website, or topics provided.' and has an 'Add topics' button. It displays 2 commits, 3 branches, 0 releases, and 0 contributors. A red box highlights the 'Your recently pushed branches:' section, which lists 'Release\_2.4\_DTC\_VIEWS\_1 (2 minutes ago)'. Another red box highlights the green 'Compare & pull request' button. Below this, there's a branch dropdown set to 'master', a 'New pull request' button, and links for Create new file, Upload files, Find file, and Clone or download. The commit history shows 'SFDCSteele first commit' (Latest commit 81729f5 17 days ago) and '.settings' (Initial load 17 days ago).

# Work Instructions: Sync to Main Branch

## - Pull Request (2 of 3)

### Who:

- Developers or Team Development Coordinator

### Steps:

- Click on 'Create a pull request'
- Set the source (i.e. feature branch) and the target (i.e. main dev branch)
- Put in comments for reviewer
- Select specific reviewer if applicable, else leave blank
- Click 'Create pull request'
- Wait or seek out for someone to approve

The screenshot shows the GitHub interface for creating a pull request. At the top, the repository is identified as SFDCSteele / VADemo. Below the header, there are tabs for Code, Issues (0), Pull requests (0), Projects (0), Wiki, Insights, and Settings. A red box highlights the 'Open a pull request' button. The main area is titled 'Open a pull request' and contains instructions: 'Create a new pull request by comparing changes across two branches. If you need to, you can also compare across for...'. It shows dropdown menus for 'base: master' and 'compare: Release\_2.4\_DTC\_VIEWS\_1', both of which are highlighted with a red box. A green checkmark indicates 'Able to merge.' Below this, a red box highlights a commit message: 'Testing the commit'. The message body contains the text: 'We've modified some code, committed it to the repository, and now we are attempting to merge it to the main branch'. At the bottom, there is a note about attaching files and a red box highlights the 'Create pull request' button.

# Work Instructions: Sync to Main Branch

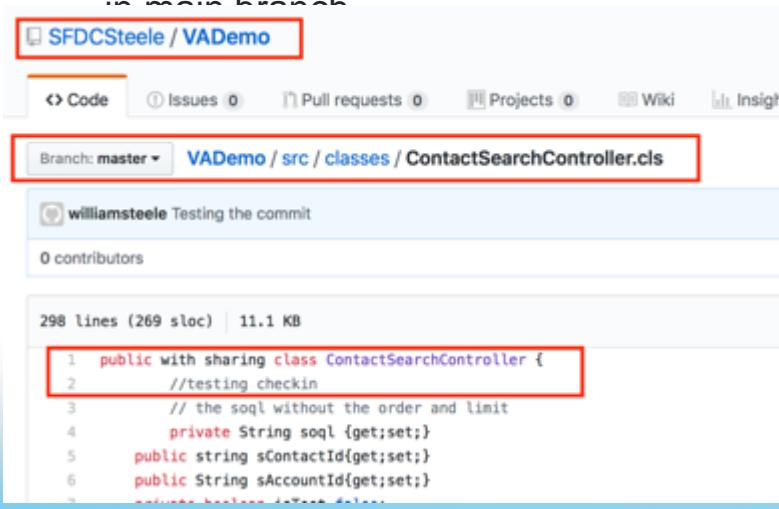
## - Pull Request (3 of 3)

### Who:

- Developers

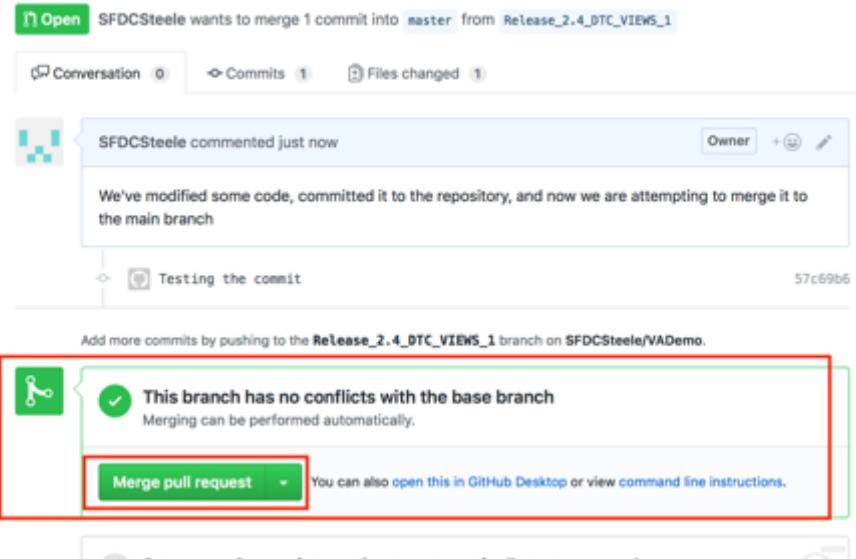
### Steps:

- If approved, approver or original developer can click on 'Merge' to merge code to main branch
- Verify that change has been updated in main branch



```
1 public with sharing class ContactSearchController {  
2     //testing checkin  
3     // the sql without the order and limit  
4     private String sql {get;set;}  
5     public string sContactId{get;set;}  
6     public String sAccountId{get;set;}  
7 }
```

### Testing the commit #1



SFDCSteele wants to merge 1 commit into `master` from `Release_2.4_DTC_VIEWS_1`

Conversation 0 Commits 1 Files changed 1

SFDCSteele commented just now

We've modified some code, committed it to the repository, and now we are attempting to merge it to the main branch

Testing the commit

Add more commits by pushing to the `Release_2.4_DTC_VIEWS_1` branch on `SFDCSteele/VADemo`.

This branch has no conflicts with the base branch  
Merging can be performed automatically.

Merge pull request You can also open this in GitHub Desktop or view command line instructions.

# Work Instructions: Approve a Pull Request (1 of 2)

## Who:

- Developers (Peers or leads)

## Steps:

- On browser, navigate to applicable GitHub URL
- Click on 'Pull Request' button
- Drill down into pull request

SFDCSteele / VADemo

No description, website, or topics provided.

Add topics

4 commits 3 branches 0 releases 0 contributors

Branch: master New pull request

Create new file Upload files Find file Clone or download

SFDCSteele Merge pull request #1 from SFDCSteele/Release\_2.4\_DTC\_VIEWS\_1 ... Latest commit 2c1db8b 8 minutes ago

File	Commit Message	Time Ago
.settings	initial load	17 days ago
Referenced Packages	initial load	17 days ago
src	Testing the commit	13 minutes ago
.project	initial load	17 days ago
README.md	first commit	17 days ago
salesforce.schema	initial load	17 days ago
README.md	initial load	17 days ago

# Work Instructions: Approve a Pull Request (2 of 2)

## Who:

- Developers

## Steps:

- Review details of change
- Click on 'Approve' or 'Decline'
- If approved, approver or original developer can click on 'Merge'

The image shows a sequence of screenshots from a GitHub-like interface illustrating the pull request approval process.

- Pull Request List:** Shows multiple pull requests. One pull request is highlighted with a red box around its title and status bar. The status bar indicates it's "Merged".
- Pull Request Detail View:** Shows the details of the merged pull request. A comment from "SFDCSteele" is visible, followed by a "Testing the commit" message. The commit history shows a merge commit from "SFDCSteele" into "Release\_2.4\_DTC\_VIEWS\_1".
- Merge Confirmation Dialog:** A modal dialog titled "Merge pull request #1 from SFDCSteele/Release\_2.4\_DTC\_VIEWS\_1 #2" is shown. It contains a message: "The merge is approved and can be committed." and a "Confirm merge" button, which is also highlighted with a red box.

# Repository Management

# Work Instructions: Merge Conflicts (1 of 4)

## Who:

- Developers

## Steps:

- When two developers try to “Pull”/Update the same file on the main branch, the first will succeed while the 2<sup>nd</sup> will result in an error
- Click on ‘More Information’ to see steps needed

The screenshot shows a Stash pull request interface. At the top right, there is a 'Merge' button with a yellow warning icon, which is highlighted with a red box. Below it, the 'Update 10/13' section shows an error message: 'This pull request can't be merged. You will need to resolve conflicts to be able to merge. More information.' This message is also highlighted with a red box. A modal window titled 'Issues Merging the Pull Request' provides step-by-step instructions for resolving conflicts:

- Step 1:** Fetch the changes (saving the source branch as FETCH\_HEAD).  
git fetch origin Release\_2.4\_SPR\_2
- Step 2:** Checkout the target branch and merge in the changes from the source branch. Resolve conflicts.  
git checkout master  
git merge FETCH\_HEAD
- Step 3:** After the merge conflicts are resolved, stage the changes accordingly, commit the changes and push.  
git commit  
git push origin HEAD
- Step 4:** The pull request will be updated and marked as merged.

At the bottom right of the modal, there is a 'Close' button. On the right side of the main interface, there are participant and action buttons: '1 Participant', 'Unwatch this pull request', and 'Learn more'.

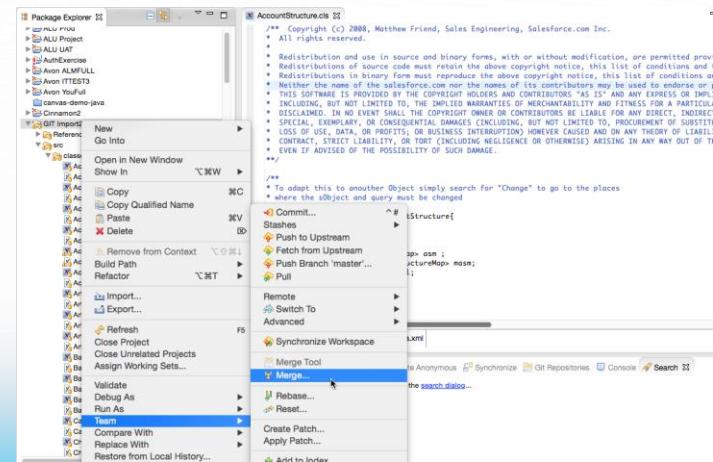
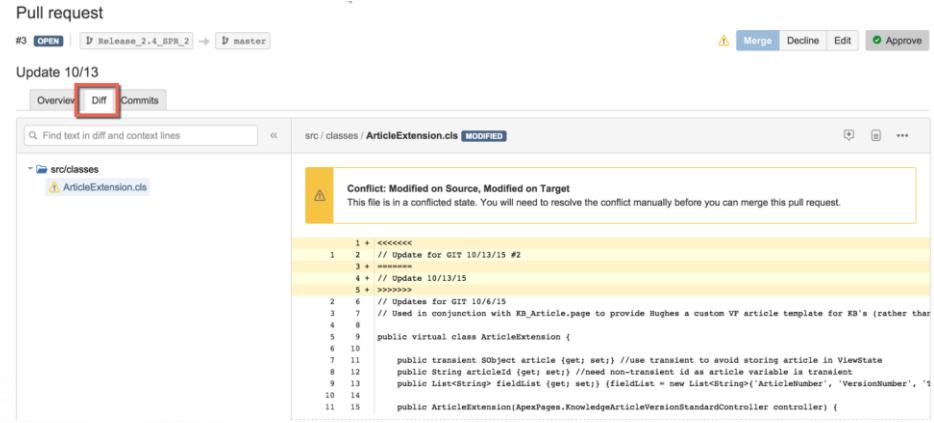
# Work Instructions: Merge Conflicts (2 of 4)

## Who:

- Developers

## Steps:

- View the conflict by clicking on the 'Diff' tab
- Within Eclipse, switch to the master branch by right clicking the project/workspace and going to Team->Switch To->master
- Go to Team->Merge
- Select the Local Branch to merge
- Click Merge



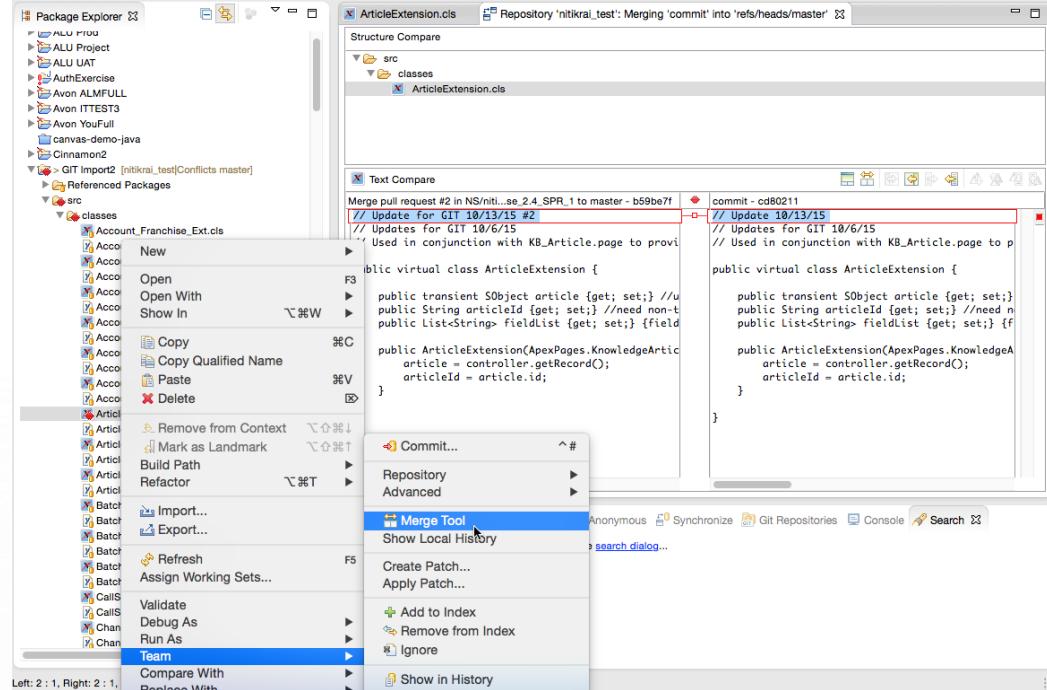
# Work Instructions: Merge Conflicts (3 of 4)

## Who:

- Developers

## Steps:

- Go to the file with the conflict (denoted by red dots), right click, and go to Team->Merge Tool
- Make the changes needed



See full details in:

[http://wiki.eclipse.org/EGit/User\\_Guide#Resolving\\_a\\_merge\\_conflict](http://wiki.eclipse.org/EGit/User_Guide#Resolving_a_merge_conflict)

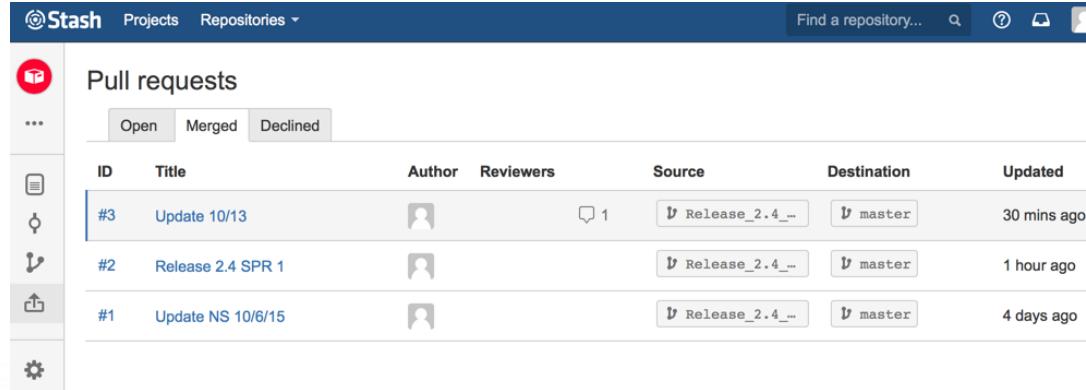
# Work Instructions: Merge Conflicts (4 of 4)

## Who:

- Developers

## Steps:

- Save the file, then right click file Team->Add to Index
- Select Commit and Push
- View in Git/Stash that Pull Request has been completed



The screenshot shows the Stash application interface with the title "Pull requests". There are three tabs at the top: "Open", "Merged", and "Declined", with "Declined" being the active tab. On the left, there is a sidebar with icons for repository management: a red circle with a white icon, three dots, a document, a magnifying glass, a refresh, an upward arrow, and a gear. The main area displays a table of pull requests with the following columns: ID, Title, Author, Reviewers, Source, Destination, and Updated. Three pull requests are listed:

ID	Title	Author	Reviewers	Source	Destination	Updated
#3	Update 10/13	[User Icon]	1	Release_2.4...	master	30 mins ago
#2	Release 2.4 SPR 1	[User Icon]		Release_2.4...	master	1 hour ago
#1	Update NS 10/6/15	[User Icon]		Release_2.4...	master	4 days ago

See full details in:

[http://wiki.eclipse.org/EGit/User\\_Guide#Resolving\\_a\\_merge\\_conflict](http://wiki.eclipse.org/EGit/User_Guide#Resolving_a_merge_conflict)

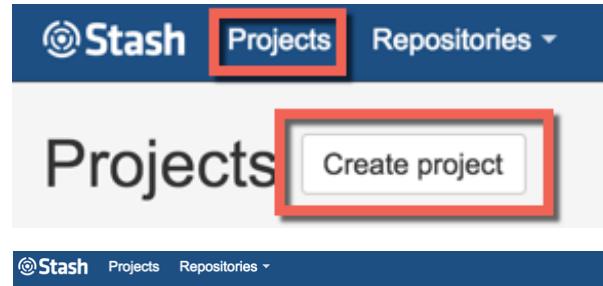
# Work Instructions: Create Project

## Who:

- Admin

## Steps:

- Create new projects for each Trunk / Org (NAD, Brazil, Yahsat, or Sage)
- Click on the Projects tab and click on 'Create Project'
- Give it an appropriate name and key
- Click the 'Create Project' button

A screenshot of a 'Create a Project' dialog box. At the top left, it says 'Create a Project'. Below that, there are two input fields: 'Project name\*' with the value 'Hughes NAD' and 'Project key\*' with the value 'NAD'. Underneath the key field is a note: 'Eg. AT (for a project named Atlassian)'. There is also a 'Description' field which is currently empty. At the bottom left is a circular 'Project Avatar' placeholder with a small icon of a cube. To the right of the placeholder is a 'Change avatar' button. At the very bottom of the dialog are two buttons: a blue 'Create project' button on the left and a white 'Cancel' button on the right.

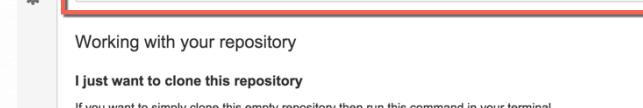
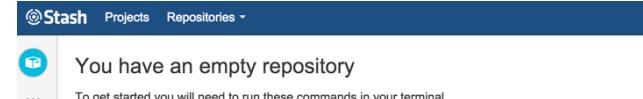
# Work Instructions: Create Repository (Trunk or Branch)

## Who:

- Admin

## Steps:

- Export metadata from org using Ant retrieve (see Ant slides)
- Click on the 'Repository' icon within the Project, and click on the 'Create Repository' box
- Give the 'Repository' a name, and follow the steps provided to upload metadata code from your local (pulled from Ant)



# Work Instructions: Set Up Approvers

## - Pull Request (1 of 2)

### Who:

- Admin

### Steps:

- On browser, navigate to applicable Git/Stash URL
- Click on 'Settings' button
- Click on 'Pull requests'

The screenshot shows the Stash Source interface. At the top, the URL is https://www.hnsdevops.com/scm/projects/NS/repos/nitikrai\_test/browse. Below the header, there's a sidebar with icons for Apps, salesforce.com Book, Aloha!, Intranet, Salesforce Prod, and Salesforce Test. The main area shows the repository structure for 'Nitikrai\_Test': .master, .settings, Referenced Packages, src, .project, and salesforce.schema. At the bottom left of the sidebar, there's a 'Settings' button, which is highlighted with a red box.

The screenshot shows the Stash Settings interface for the repository 'Nitikrai\_Test'. The URL is https://www.hnsdevops.com/scm/projects/NS/repos/nitikrai\_test/settings. The sidebar on the left lists Repository details, SECURITY, Repository permissions, Branch permissions, Access keys, Audit log, WORKFLOW, Hooks, and Pull requests. The 'Pull requests' button is highlighted with a red box.

The screenshot shows the Stash Settings interface for the repository 'Nitikrai\_Test'. The URL is https://www.hnsdevops.com/scm/projects/NS/repos/nitikrai\_test/settings. The sidebar on the left lists Repository details, SECURITY, Repository permissions, Branch permissions, Access keys, Audit log, WORKFLOW, Hooks, and Pull requests. The 'Pull requests' button is highlighted with a red box. The main panel shows 'Repository details' with the name 'Nitikrai\_Test' and other settings like Default branch (set to master), Allow forks (unchecked), and Branching model.

# Work Instructions: Set Up Approvers

## - Pull Request (2 of 2)

### Who:

- Admin

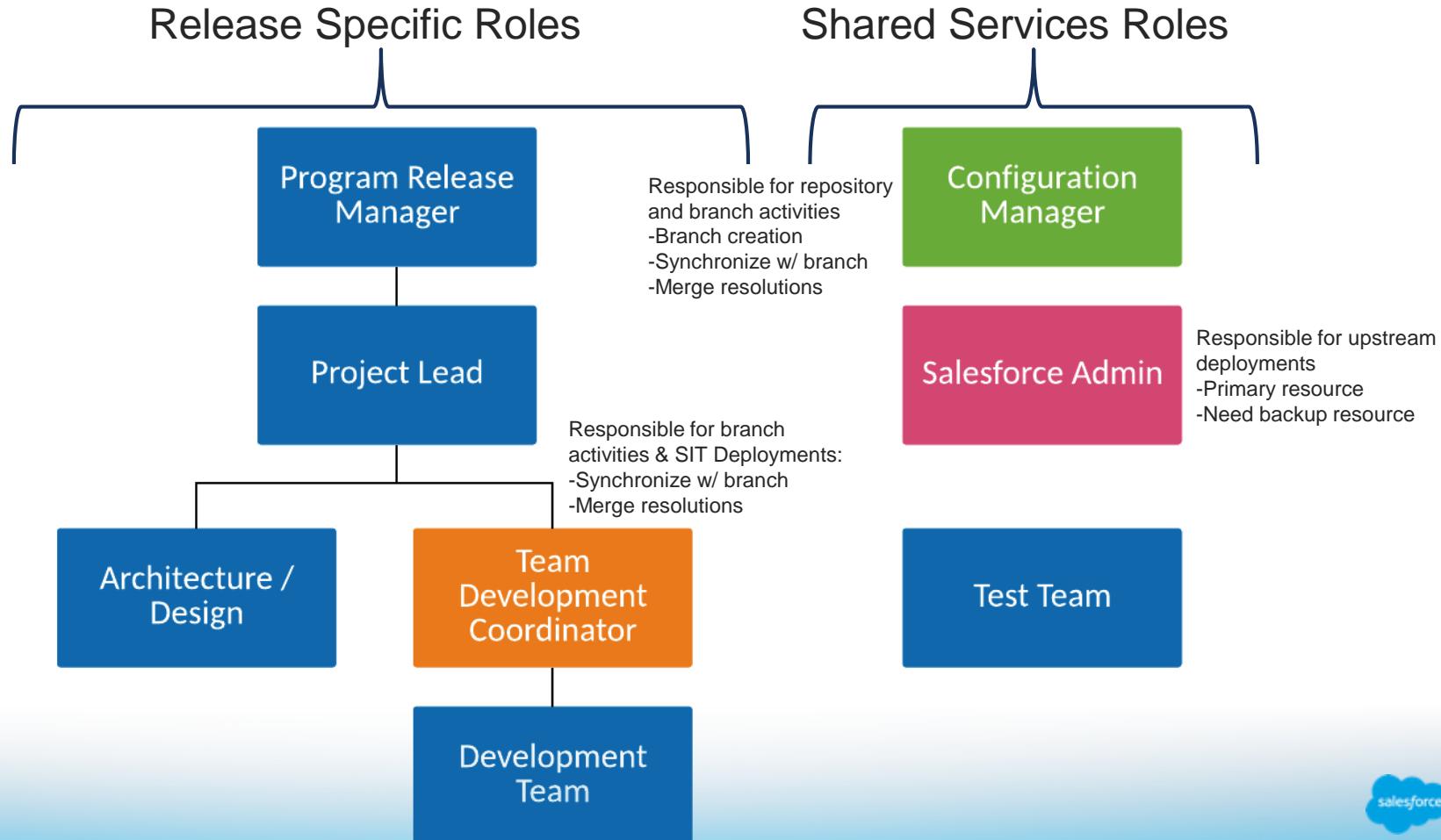
### Steps:

- Check the 'Requires approvers' and set the number of approvers needed
- Click Save

The screenshot shows the GitHub repository settings page. On the left, there's a sidebar with various settings options like Repository details, Security, and Workflow. Under the Workflow section, 'Pull requests' is selected. In the main area, under 'Pull requests', there's a checkbox labeled 'Requires 1 approver'. This checkbox is checked and highlighted with a red border. Below it, there's explanatory text: 'At a minimum, pull requests must be approved by the number of users above before it can be merged'. There are also other unchecked checkboxes for 'Requires all tasks to be resolved' and 'Requires a minimum of 1 successful builds'. At the bottom right of the 'Pull requests' section are 'Save' and 'Cancel' buttons.

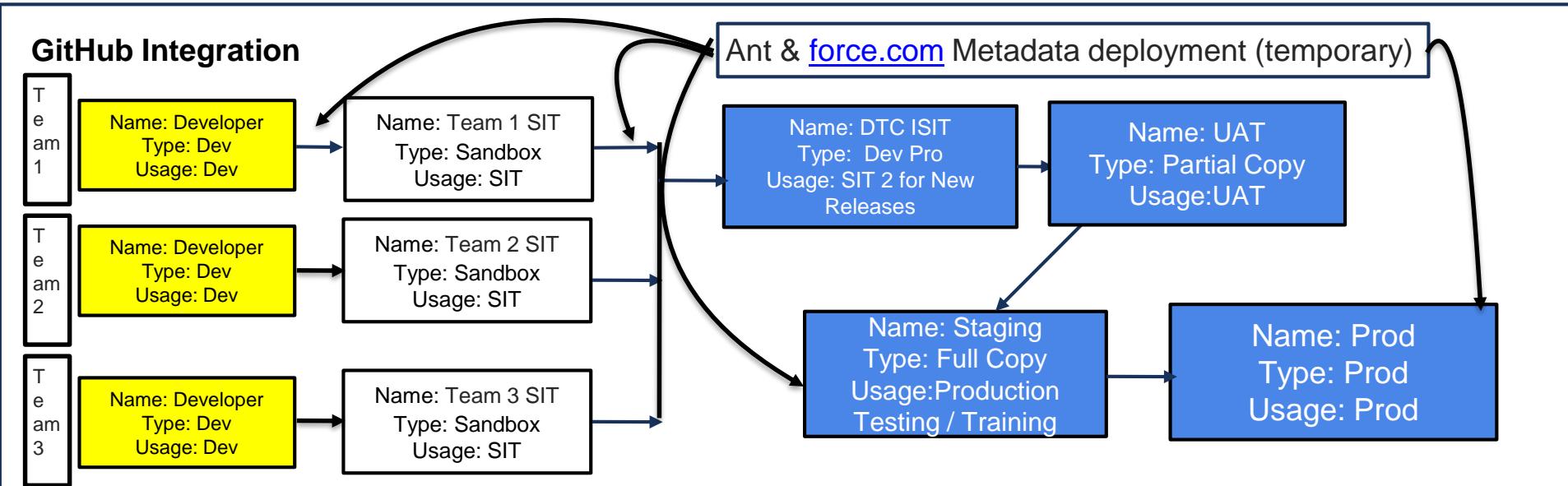
# Scripted Deployment

# Roles



# Flow of Code through the VA DTC Environments

Code must move through SDLC of Dev -> SIT -> SIT 2 -> UAT -> Prod



- Code is only pushed from GitHub
- Ant and shell scripts will be used to automate the deployments and pull from GitHub

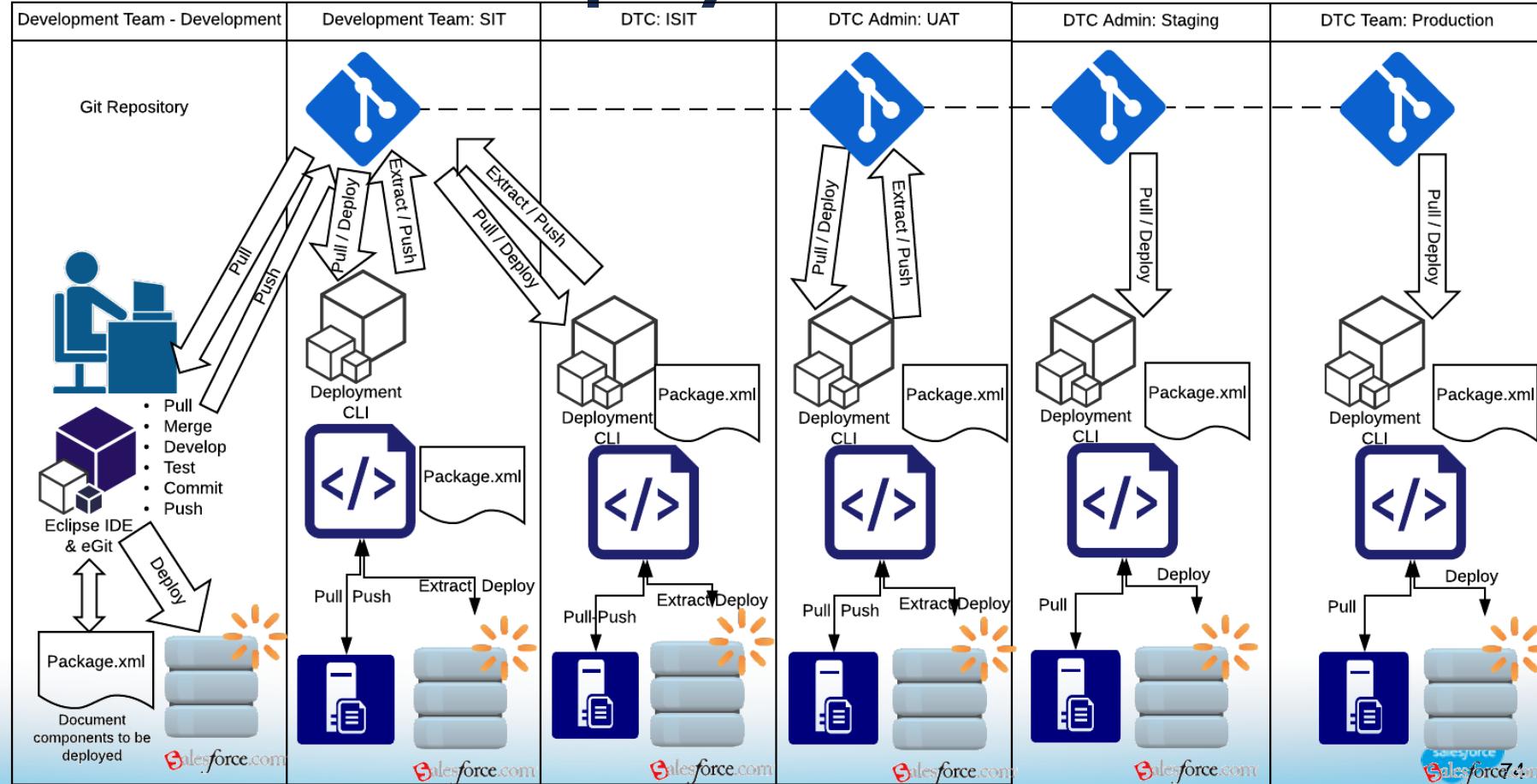
**Legend:** 1 - Emergency fixes to Prod Code Base

Individual Developer

Prod Code Base

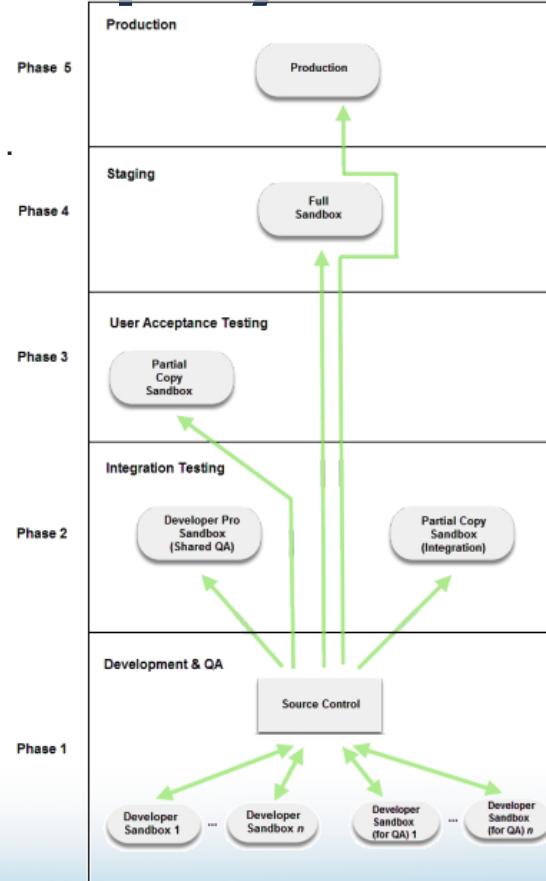


# Environment Deployments

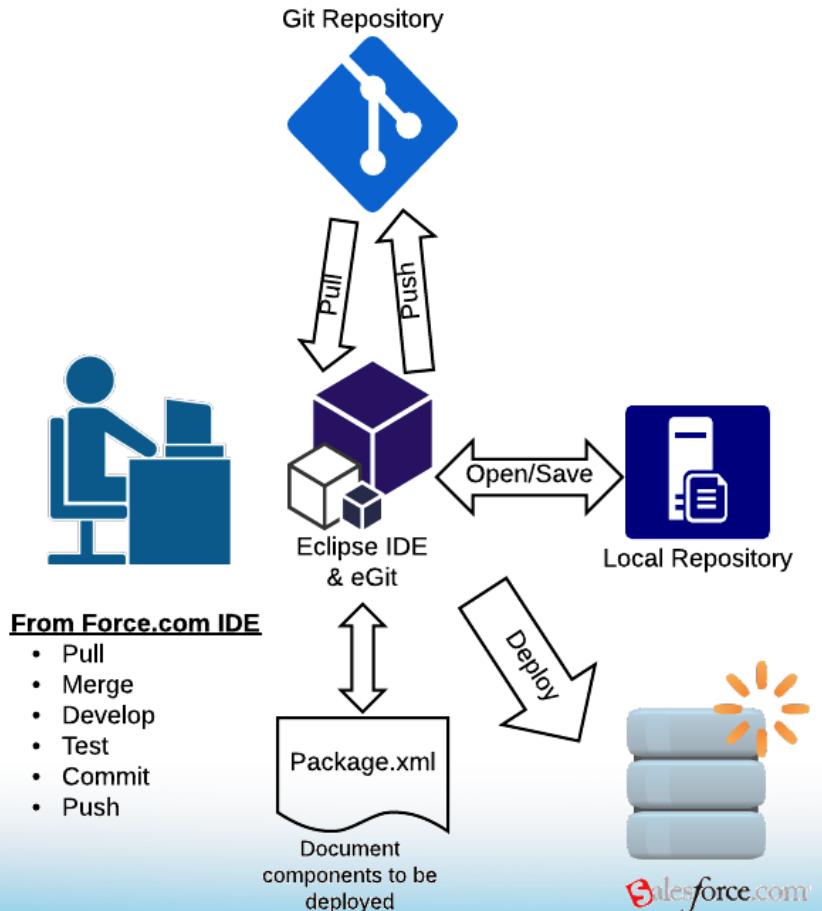


# Environment Deployments

A view from a different angle...

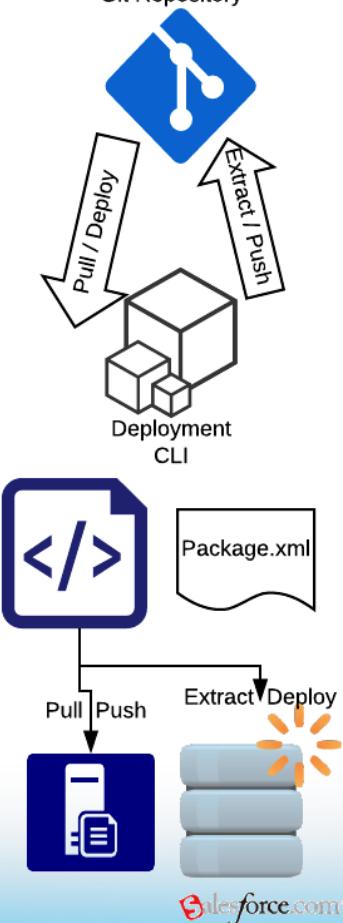


# Development Team: Dev Deployment



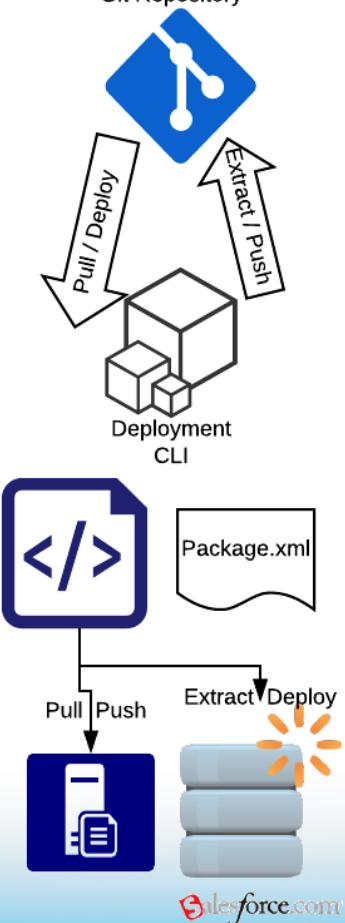
Action	Deployment Action Description
<b>Scenario</b>	New Dev instance
<b>dev-git-clone</b>	Create directory structure, clone the remote repository and the pull that latest source
<b>Scenario</b>	Update of the Dev instance
<b>dev-git-pull</b>	Update the current local repository from the remote repository
<b>Scenario</b>	Changes made in ORG, need to be checked in (from changesets too)
<b>dev-extract</b>	Extract all configuration from the org based on package.xml to local repository
<b>dev-push</b>	Push changes in the local repository to the remote repository
<b>dev-extract-push</b>	Extract all configuration from the org based on package.xml to local repository and then push to the remote repository
<b>Scenario</b>	Deploy local repository to SF org
<b>dev-deploy</b>	Deploy to the SF Org based on the package.xml
<b>dev-deploy-check</b>	Deploy to the SF Org based on the package.xml as a validate only deployment
<b>dev-quick-deploy</b>	Quick deploy the validated deployment
<b>dev-pull-deploy</b>	Pull the latest updates from the remote repository and deploy to the SF Org based on package.xml

# Development Team: SIT Deployment



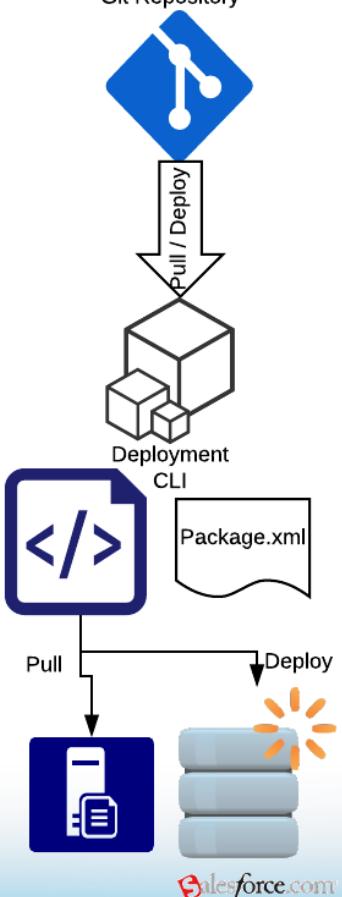
CLI Deployment Action	Deployment Action Description
<b>Scenario</b>	New SIT instance
<b>sit-git-clone</b>	Create directory structure, clone the remote repository and the pull that latest source
<b>Scenario</b>	Update of the SIT instance
<b>sit-git-pull</b>	Update the current local repository from the remote repository
<b>Scenario</b>	Changes made in ORG, need to be checked in (from changesets too)
<b>sit-extract</b>	Extract all configuration from the org based on package.xml to local repository
<b>sit-push</b>	Push changes in the local repository to the remote repository
<b>sit-extract-push</b>	Extract all configuration from the org based on package.xml to local repository and then push to the remote repository
<b>Scenario</b>	Deploy local repository to SF org
<b>sit-deploy</b>	Deploy to the SF Org based on the package.xml
<b>sit-deploy-check</b>	Deploy to the SF Org based on the package.xml as a validate only deployment
<b>sit-quick-deploy</b>	Quick deploy the validated deployment
<b>sit-pull-deploy</b>	Pull the latest updates from the remote repository and deploy to the SF Org based on package.xml

# Development Team: UAT Deployment



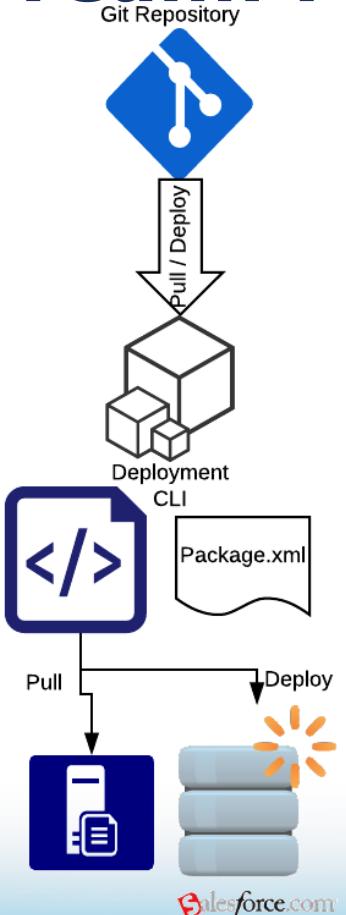
Action	Deployment Action Description
<b>Scenario</b>	New UAT instance
<b>uat-git-clone</b>	Create directory structure, clone the remote repository and the pull that latest source
<b>Scenario</b>	Update of the UAT instance
<b>uat-git-pull</b>	Update the current local repository from the remote repository
<b>Scenario</b>	Changes made in ORG, need to be checked in (from changesets too)
<b>uat-extract</b>	Extract all configuration from the org based on package.xml to local repository
<b>uat-push</b>	Push changes in the local repository to the remote repository
<b>uat-extract-push</b>	Extract all configuration from the org based on package.xml to local repository and then push to the remote repository
<b>Scenario</b>	Deploy local repository to SF org
<b>uat-deploy</b>	Deploy to the SF Org based on the package.xml
<b>uat-deploy-check</b>	Deploy to the SF Org based on the package.xml as a validate only deployment
<b>uat-quick-deploy</b>	Quick deploy the validated deployment
<b>uat-pull-deploy</b>	Pull the latest updates from the remote repository and deploy to the SF Org based on package.xml

# Development Team: Staging Deployment



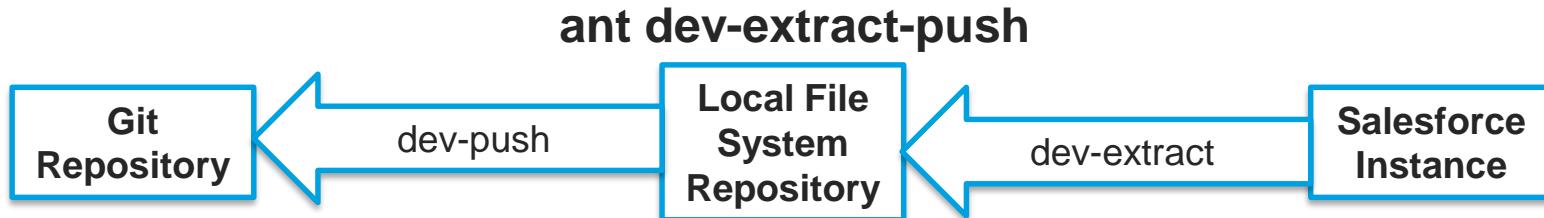
Action	Deployment Action Description
<b>Scenario</b>	New Staging instance
<b>staging-git-clone</b>	Create directory structure, clone the remote repository and the pull that latest source
<b>Scenario</b>	Update of the Staging instance
<b>staging-git-pull</b>	Update the current local repository from the remote repository
<b>Scenario</b>	Changes made in ORG, need to be checked in (from changesets too)
<b>staging-extract</b>	Extract all configuration from the org based on package.xml to local repository
<b>staging-push</b>	Push changes in the local repository to the remote repository
<b>staging-extract</b>	Extract all configuration from the org based on package.xml to local repository and then push to the remote repository
<b>Scenario</b>	Deploy local repository to SF org
<b>staging-deploy</b>	Deploy to the SF Org based on the package.xml
<b>staging-deploy</b>	Deploy to the SF Org based on the package.xml as a validate only deployment
<b>staging-quick-deploy</b>	Quick deploy the validated deployment
<b>staging-pull-deploy</b>	Pull the latest updates from the remote repository and deploy to the SF Org based on package.xml

# Development Team: Production Deployment



Action	Deployment Action Description
<b>Scenario</b>	New Production instance
<b>prod-git-clone</b>	Create directory structure, clone the remote repository and the pull that latest source
<b>Scenario</b>	Update of the Production instance
<b>prod-git-pull</b>	Update the current local repository from the remote repository
<b>Scenario</b>	Changes made in ORG, need to be checked in (from changesets too)
<b>prod-extract</b>	Extract all configuration from the org based on package.xml to local repository
<b>prod-push</b>	Push changes in the local repository to the remote repository
<b>prod-extract-push</b>	Extract all configuration from the org based on package.xml to local repository and then push to the remote repository
<b>Scenario</b>	Deploy local repository to SF org
<b>prod-deploy</b>	Deploy to the SF Org based on the package.xml
<b>prod-deploy-check</b>	Deploy to the SF Org based on the package.xml as a validate only deployment
<b>prod-quick-deploy</b>	Quick deploy the validated deployment
<b>prod-pull-deploy</b>	Pull the latest updates from the remote repository and deploy to the SF Org based on package.xml

# Developer Profiles and Activities



1. Developer: no/minimal team – performs the tasks above stand-alone (support from DTC)
2. Developer: part of a team – Team Development Coordinator performs tasks above
3. Developer: Full IDE – performs all functions within the Force.com IDE (specified previously)

# Developer Deployment Setup

ant dev-extract-push



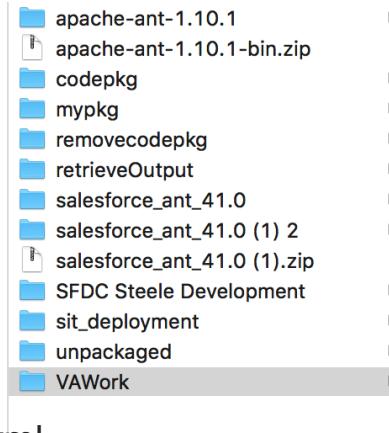
For a developer or a Team Development Coordinator to perform the tasks above, the setup below much be completed:

- Download and install the GIT Command Line Interface (CLI) from <https://git-scm.com/downloads>
- Install Force.com Migration tool (and ANT) from [https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/forcemigrationtool\\_install.htm](https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/forcemigrationtool_install.htm)
- Set environment variables to meet your environment-see the example below:  
export ANT\_HOME=/Users/<user>/Documents/workspace/apache-ant-1.10.1/bin  
export PATH=/Users/<user>/Documents/workspace/apache-ant-1.10.1:/Users/<user>/Documents/workspace/salesforce\_ant\_41.0/ant-salesforce.jar:/Users/<user>/Documents/workspace/apache-ant-1.10.1/bin:/Users/<user>/Documents/workspace/apache-ant-1.10.1/lib:\$

# Force.com Migration Tool Artifacts

## build.properties

The build.properties file contains all the properties used in the build.xml. Defaults can be replaced by environment specific values, removing the need to enter a list of parameters each time an ant command is issued. This file can be copied to the root directory of your Eclipse workspace and modified, so that there is not worries of it being overwritten or being flagged to need to be checked-in.

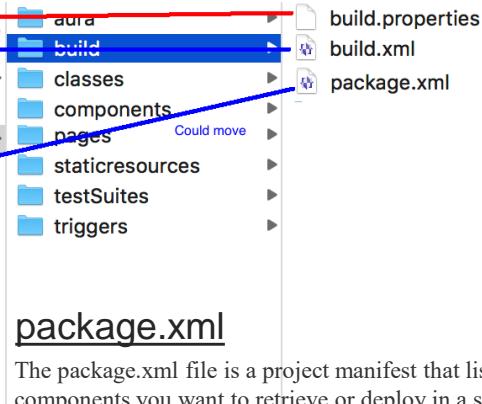


## build.xml

The build.xml file specifies a series of commands to be executed by Ant. Within the build.xml file are named targets that process a series of commands when you run Ant with a target name. The following parameters can be set for each `<sf:retrieve>` target:

There are a number of VA specific commands that have been created to support the deployment process at the VA.

This file can also be moved to your workspace root if it needs to be customized. Leaving it in the src/build directory allows you to receive any new or updated targets that will be provided.



## package.xml

The package.xml file is a project manifest that lists all the components you want to retrieve or deploy in a single request. You can retrieve or deploy only a single package at a time.

Using this file instead of changesets, teams will be able to communicate all the metadata components they wish to be deployed, thus providing the ability to always perform a “delta” deployment.

These files can be merged into one, deployed individually, or all packages can be deployed with one command.

# Force.com Migration Tool - build.properties

```
1 # build.properties
2 #
3
4 #git repository & branch used for this effort
5 sf.repository = <insert your git repository URI here>
6 sf.branch = <Insert the specific branch name here>
7
8 # Specify the login credentials for the desired Salesforce organization
9 dev.username = <Insert your Salesforce username here>
10 dev.password = <Insert your Salesforce password here>
11 #dev.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
12 dev.serverurl = https://login.salesforce.com
13
14 sit.username = <Insert your Salesforce username here>
15 sit.password = <Insert your Salesforce password here>
16 #sit.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
17 sit.location = <set directory>
18 sit.serverurl = https://test.salesforce.com
19
20 isit.username = <Insert your Salesforce username here>
21 isit.password = <Insert your Salesforce password here>
22 #isit.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
23 isit.location = <set directory>
24 isit.serverurl = https://test.salesforce.com
25
26 uat.username = <Insert your Salesforce username here>
27 uat.password = <Insert your Salesforce password here>
28 #uat.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
29 uat.location = <set directory>
30 uat.serverurl = https://test.salesforce.com
31
32 staging.username = <Insert your Salesforce username here>
33 staging.password = <Insert your Salesforce password here>
34 #staging.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
35 staging.location = <set directory>
36 staging.serverurl = https://test.salesforce.com
37
38 prod.username = <Insert your Salesforce username here>
39 prod.password = <Insert your Salesforce password here>
40 #prod.sessionId = <Insert your Salesforce session id here. Use this or username/password above. Cannot use both>
41 prod.location = <set directory>
42 prod.serverurl = https://login.salesforce.com
43
44
45 #sf.pkgName = <Insert comma separated package names to be retrieved>
46 #sf.zipFile = <Insert path of the zipfile to be retrieved>
47 #sf.metadataType = <Insert metadata type name for which listMetadata or bulkRetrieve operations are to be performed>
48
49 # Use 'https://login.salesforce.com' for production or developer edition (the default if not specified).
50 # Use 'https://test.salesforce.com' for sandbox.
51 sf.serverurl = https://login.salesforce.com
52
53 sf.maxPoll = 20
54 # If your network requires an HTTP proxy, see http://ant.apache.org/manual/proxy.html for configuration.
55 #
56
57
```



# Force.com Migration Tool - build.xml

```
1@<project name="VA usage of Salesforce Ant tasks" default="test" basedir="."> xmlns:sf="antlib:com.salesforce">
2
3  <property file=".build.properties"/>
4  <property environment="env"/>
5
6@  <!-- Setting default value for username, password and session id properties to empty string
7      so unset values are treated as empty. Without this, ant expressions such as ${sf.username}
8      will be treated literally.
9  -->
10
11 <!-- dev instance variables -->
12 <condition property="dev.username" value=""> <not> <isset property="dev.username"/> </not> </conditions>
13 <condition property="dev.password" value=""> <not> <isset property="dev.password"/> </not> </conditions>
14 <condition property="dev.sessionId" value=""> <not> <isset property="dev.sessionId"/> </not> </conditions>
15
16 <!-- sit instance variables -->
17 <condition property="sit.username" value=""> <not> <isset property="sit.username"/> </not> </conditions>
18 <condition property="sit.password" value=""> <not> <isset property="sit.password"/> </not> </conditions>
19 <condition property="sit.sessionId" value=""> <not> <isset property="sit.sessionId"/> </not> </conditions>
20
21 <!-- isit instance variables -->
22 <condition property="isit.username" value=""> <not> <isset property="isit.username"/> </not> </conditions>
23 <condition property="isit.password" value=""> <not> <isset property="isit.password"/> </not> </conditions>
24 <condition property="isit.sessionId" value=""> <not> <isset property="isit.sessionId"/> </not> </conditions>
25
26 <!-- uat instance variables -->
27 <condition property="uat.username" value=""> <not> <isset property="uat.username"/> </not> </conditions>
28 <condition property="uat.password" value=""> <not> <isset property="uat.password"/> </not> </conditions>
29 <condition property="uat.sessionId" value=""> <not> <isset property="uat.sessionId"/> </not> </conditions>
30
31 <!-- staging instance variables -->
32 <condition property="staging.username" value=""> <not> <isset property="staging.username"/> </not> </conditions>
33 <condition property="staging.password" value=""> <not> <isset property="staging.password"/> </not> </conditions>
34 <condition property="staging.sessionId" value=""> <not> <isset property="staging.sessionId"/> </not> </conditions>
35
36 <!-- prod instance variables -->
37 <condition property="prod.username" value=""> <not> <isset property="prod.username"/> </not> </conditions>
38 <condition property="prod.password" value=""> <not> <isset property="prod.password"/> </not> </conditions>
39 <condition property="prod.sessionId" value=""> <not> <isset property="prod.sessionId"/> </not> </conditions>
40
41@ <taskdef resource="com/salesforce/antlib.xml" uri="antlib:com.salesforce">
42@   <classpath>
43@     <pathelement location="../salesforce_ant_41.0/ant-salesforce.jar" />
44@   </classpath>
45@ </taskdef>
46
47@ <macrodef name = "git">
48@   <attribute name = "command" />
49@   <attribute name="options" default="" />
50@   <attribute name="dir" default="" />
51@   <attribute name="failerror" default="false" />
52@   <element name = "args" optional = "true" />
53@   <sequential>
54@     <echo message="git dir ${dir}" />
55@     <echo message="git ${command} ${args}" />
56@     <exec executable="git" dir="@{dir}" failonerror="@{failerror}">
57@       <arg line="@{command} ${options}" />
58@       <args />
```

# Force.com Migration Tool - package.xml

```
1 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
2<Package xmlns="http://soap.sforce.com/2006/04/metadata">
3<types>
4    <members>*******
```

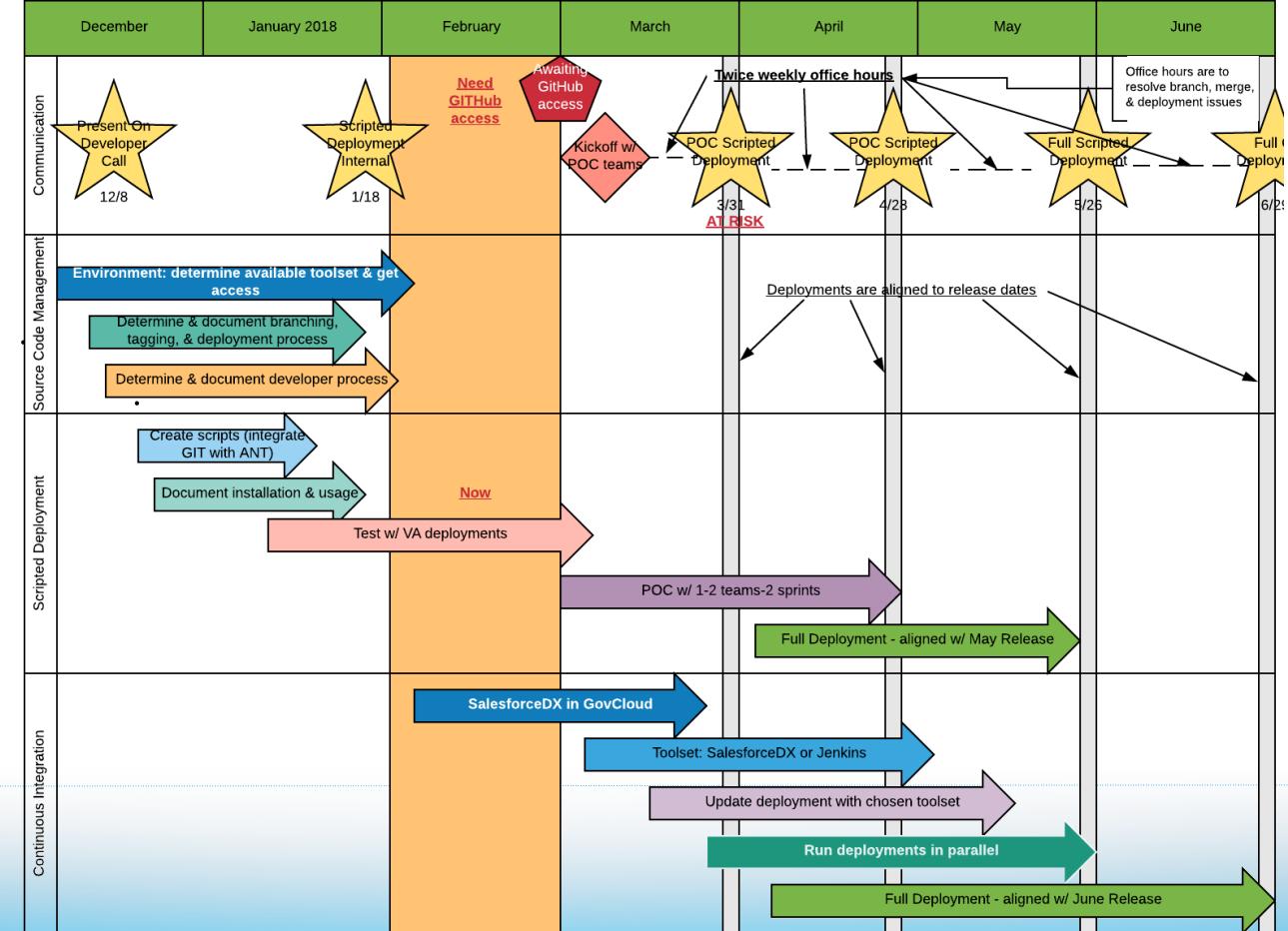
Detailed instruction regarding the contents of the package.xml file can be found at:

[https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/daas\\_package.htm](https://developer.salesforce.com/docs/atlas.en-us.daas.meta/daas/daas_package.htm)

Full list of all the available metadata types can be found at:

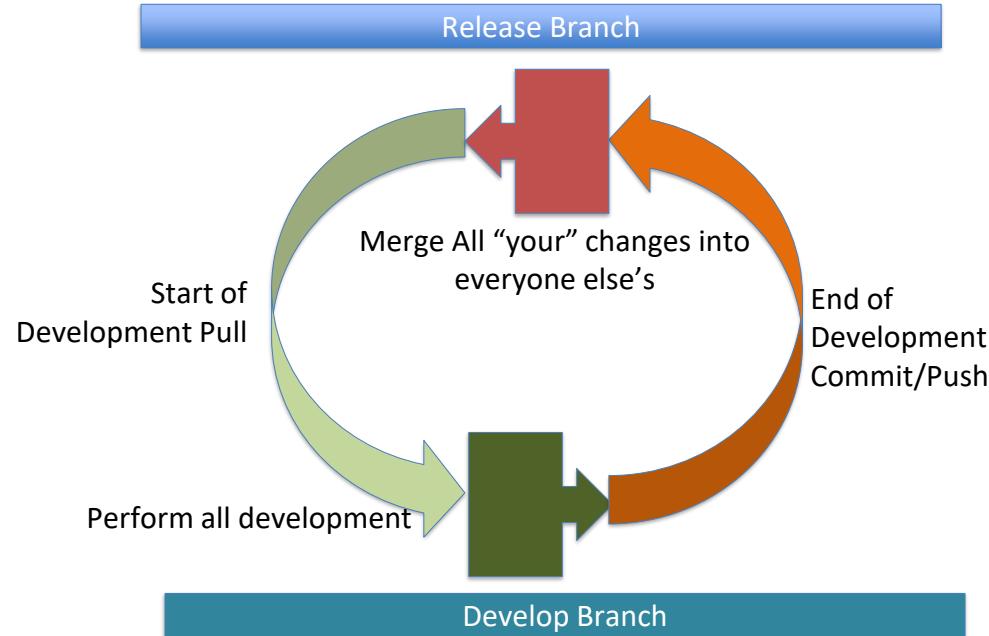
[https://developer.salesforce.com/docs/atlas.en-us.210.0.api.meta.meta/api\\_meta\\_types\\_list.htm](https://developer.salesforce.com/docs/atlas.en-us.210.0.api.meta.meta/api_meta_types_list.htm)

# Deployment Timeline

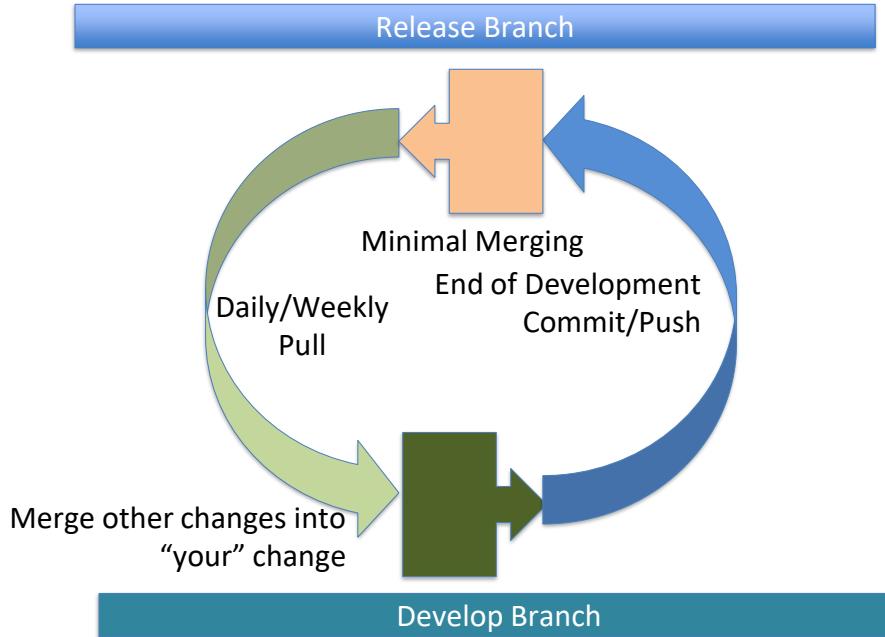


# Usual Pull/Push/Merge Process

Might appear the most logical



# Best Pull/Push/Merge Process





# Developer Training

# Developer Training

Provider	Product	Category	Location/URL
Salesforce	Trailhead	Git and GitHub Basics	<a href="https://trailhead.salesforce.com/modules/git-and-git-hub-basics/units/learn-why-version-control-is-important-for-team-based-development">https://trailhead.salesforce.com/modules/git-and-git-hub-basics/units/learn-why-version-control-is-important-for-team-based-development</a> (6 modules)
GitHub	On-demand Training	GitHub's On Demand Training	<a href="https://services.github.com/on-demand/">https://services.github.com/on-demand/</a>
GitHub	On-demand Training	GitHub's Recommended Learning Path	<a href="https://services.github.com/on-demand/resources/learning-path/">https://services.github.com/on-demand/resources/learning-path/</a>
Git	Web training	Getting Started - Git Basics	<a href="https://git-scm.com/book/en/v2/Getting-Started-Git-Basics">https://git-scm.com/book/en/v2/Getting-Started-Git-Basics</a>
RogerDudler	Web training	git - the simple guide	<a href="http://rogerdudler.github.io/git-guide/">http://rogerdudler.github.io/git-guide/</a>



# Next Steps

# Next Steps - Phase I

- Administration
  - Waiting for GitHub account from VA
  - Complete testing on all targets using recent deployment requests - create/update targets as necessary
  - Setup GitHub account and access for all
  - Create GitHub teams
  - Create approvers
  - Import production SF repository to GitHub
  - Create release branch
  - Associate teams with release branch
- Developers/all—phase I
  - Create GitHub account
  - Complete specified training
  - Install developer work station
  - Install eGit
- Developers/all—phase II \*\*after you receive your GitHub invitation to the VA repository
  - Create Eclipse Project from GIT
  - Switch to branch for development
  - Associate Sandbox to IDE
- Developers - start developing!
  - Make changes
  - Making Updates to repository
  - Commit and Push to Server – Branch Update Only
  - Sync to Main Branch \*\*only when development cycle is complete\*\*
- Team Lead / Project Lead
  - Approve a Pull Request

thank you