



The current state of gCTS and How it could improve your CI-processes for ABAP

Ulrich Auer, Karin Spiegel, SAP
November 2, 2021

PUBLIC

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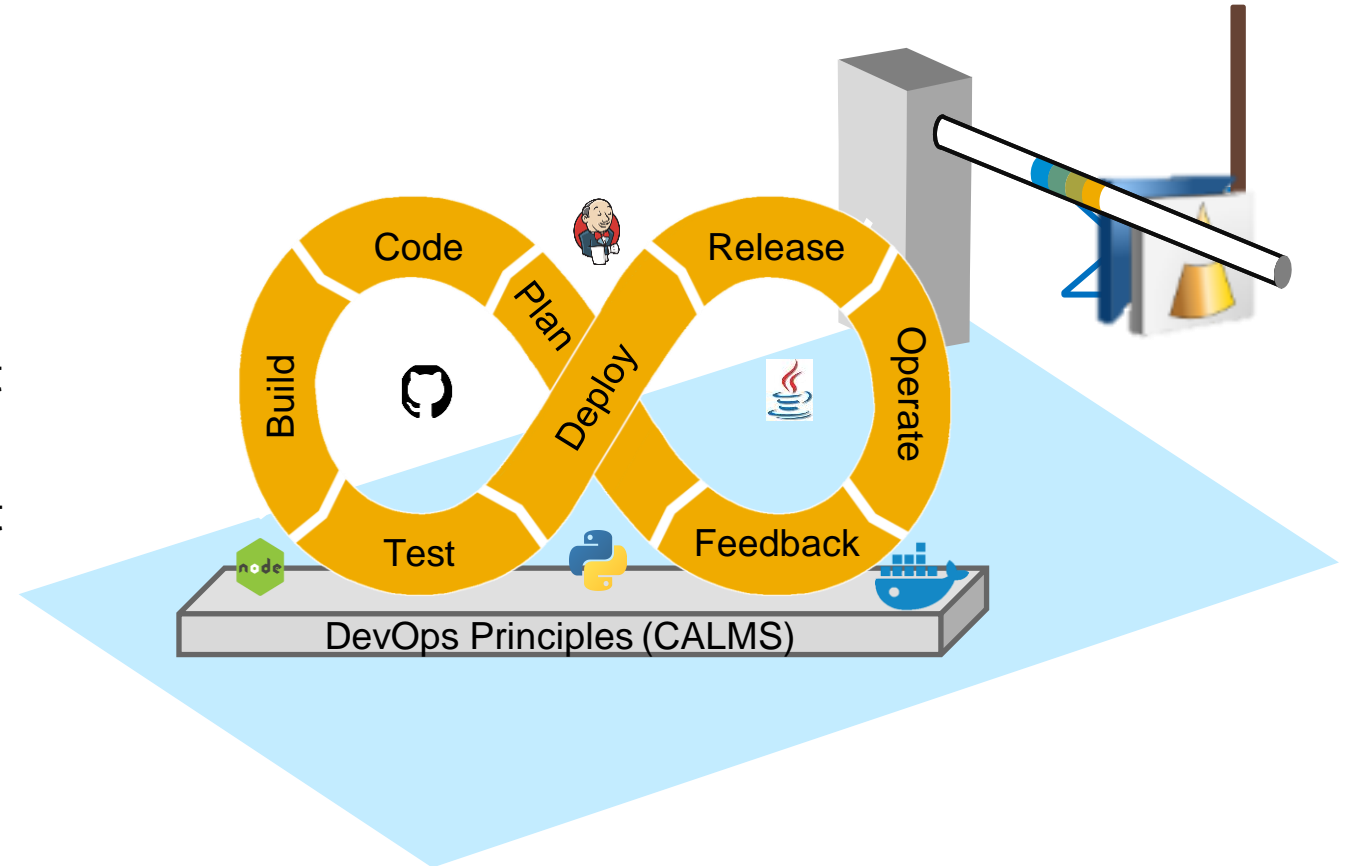
A short recap

When and why DevOps with ABAP

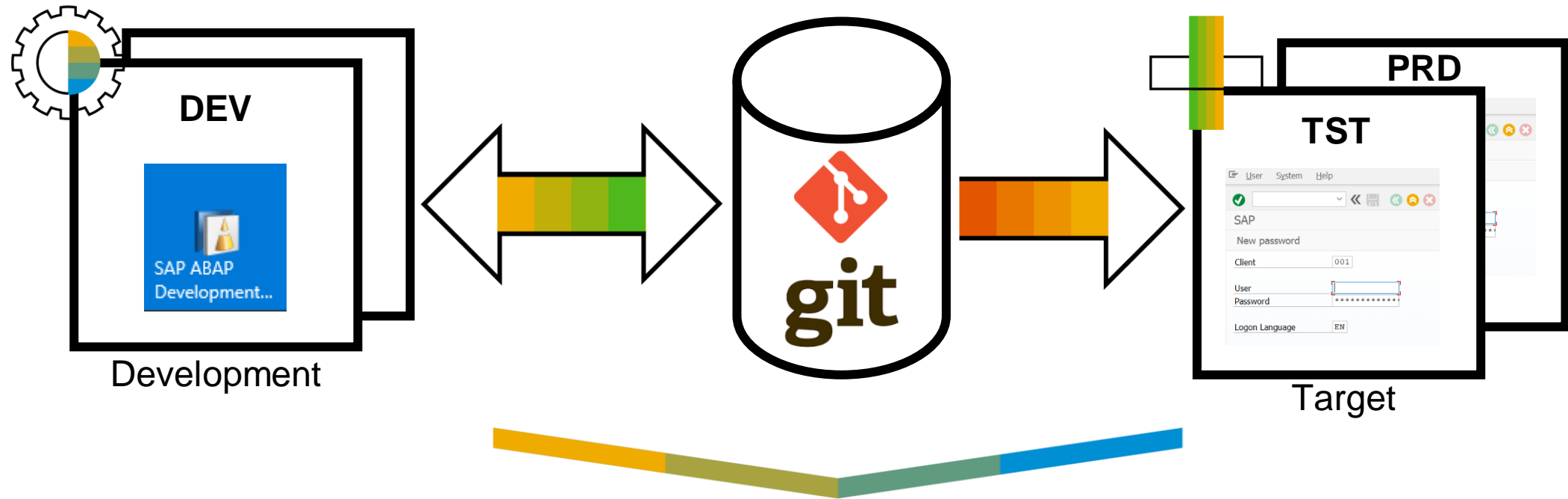
DevOps – get ABAP in

It should be possible to add ABAP to the DevOps world

- To share source code on Git
 - To enable automation of development processes via pipelines
 - To manage ABAP development similar to what you do in other languages and environments
- ➔ This is what Git-enabled CTS (gCTS) aims at



Our idea...



 CTS*   git  gCTS

* Change and Transport System

Why today

The gCTS registry to help you manage mainly your customizing via gCTS

The collaborator concept to align access handling to repositories in ABAP and git

The changes in Project 'Piper' to make steps Jenkins-independent, provide more options and remove bugs

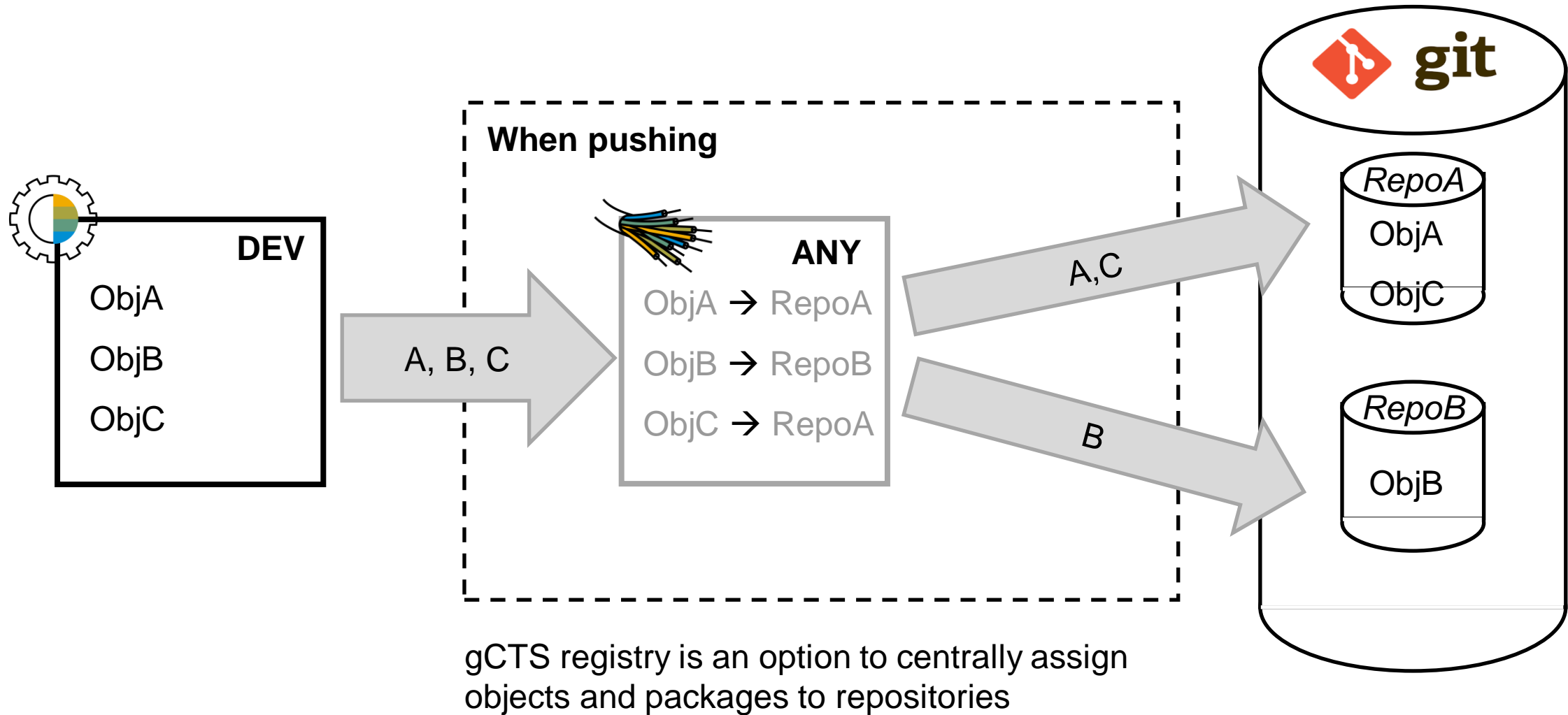
Changes to the merge process, conflict resolution and new deploy option to allow more CI like processes

This presentation is about SAP S/4HANA 2021. Features shown might not be available in other releases or might look different.

The registry

Introduction to the registry

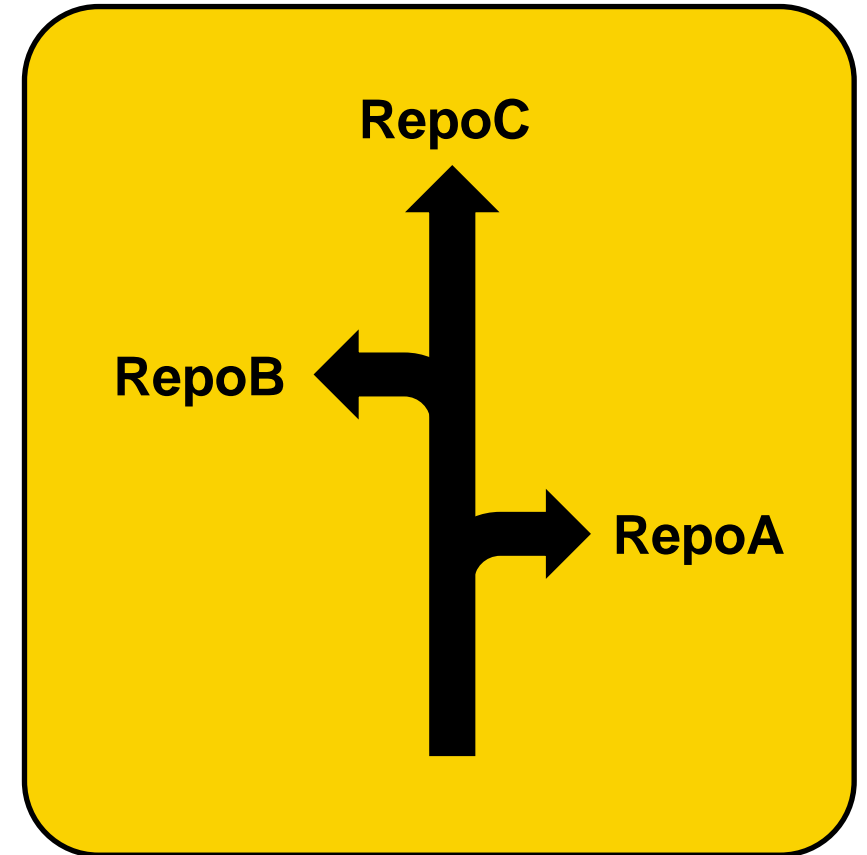
The idea of the registry



Introduction to the registry

Facts about the registry

- Registry 'knows' to which repository a certain object shall be pushed, especially if several repositories are in place.
- One persistent ABAP system 'hosts' the registry
 - Should always be up and stable
 - Must *not* be overwritten (e.g. by system refresh)
- Registration can be done from any connected system
- Registry is recommended when customizing is managed via gCTS
- Requires implementing a BAdI to get integrated in development process



Introduction to the registry

Registry for customizing

Customizing entities usually have no object catalog entries (TADIR)

Therefore, we recommend that you use the registry when customizing shall be handled via gCTS

- No need to think about the target for every transport request
- By default, the standard transport layer would be used for customizing if registry is not in use
- Registry makes sure that each customizing entity is stored in exactly one repository

And how?

- Start with one customizing repository
- Differentiate in different customizing repositories later – migration tool is planned

Introduction to the registry

How many repositories? Best practices

How many repositories?

- If customizing depends on coding / application
 - Use same repository for customizing and coding
- If customizing is client dependent
 - Use one repository with one branch per client
- If customizing is client independent and not part of an application
 - Use one repository for customizing
- If customizing depends on release
 - Use one repository with one branch per release and one branch per client per release

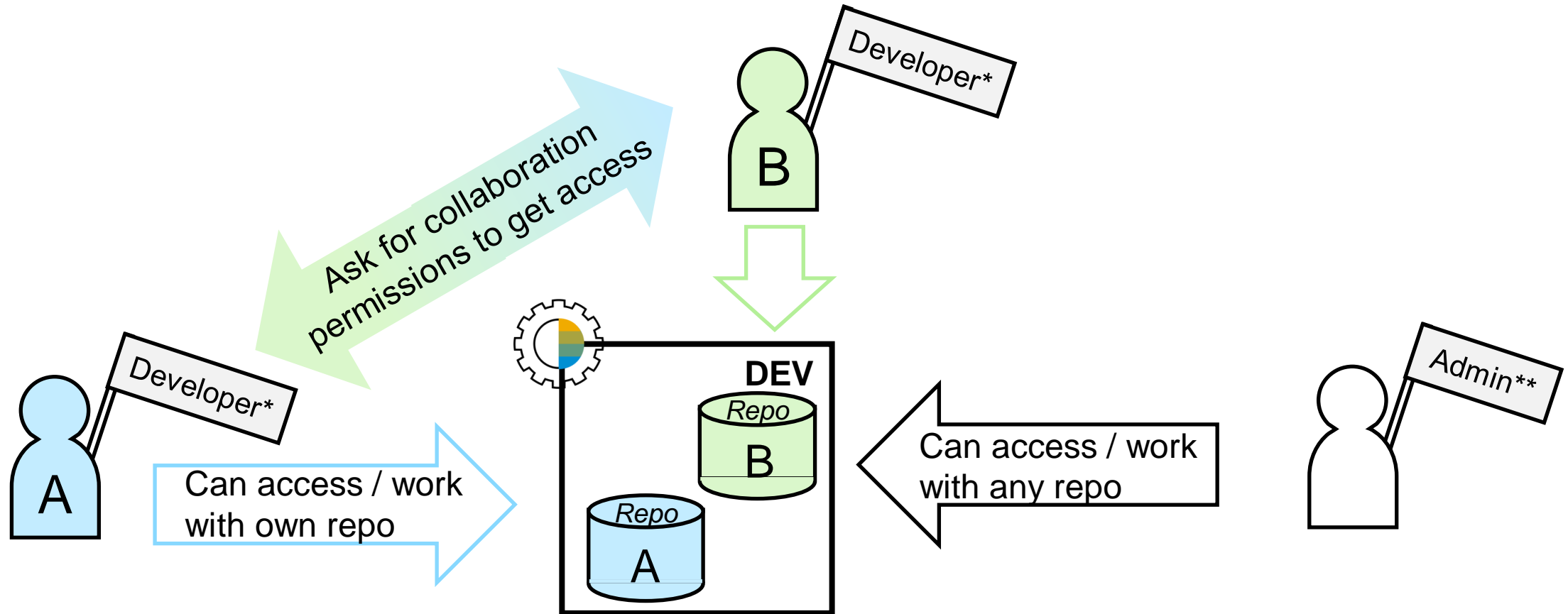
Use an appropriate naming convention for your branches

Customizing is not application data! Application data should not be pushed to git

The collaborator concept

Authentication and permissions in gCTS

Collaborating in gCTS



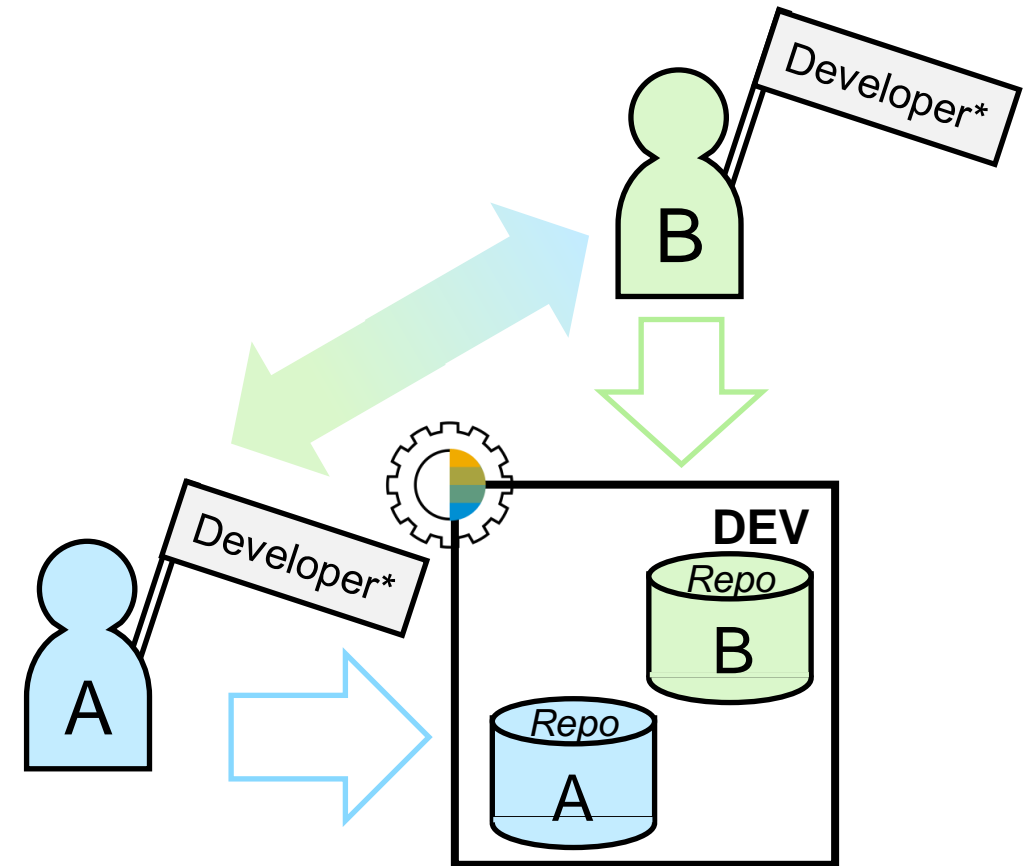
* Role: SAP_BC_GCTS_REPO_DEVELOPER

** Role: SAP_BC_GCTS_REPOSITORY_ADMIN (at least)

Authentication and permissions in gCTS

How collaborating works in gCTS

- This is about collaborating on local repositories – Git-providers have similar mechanisms, but there is no synchronization with gCTS
- You can work with teams or assign single collaborators
- Assignments are made per repository
- Teams are created centrally per system

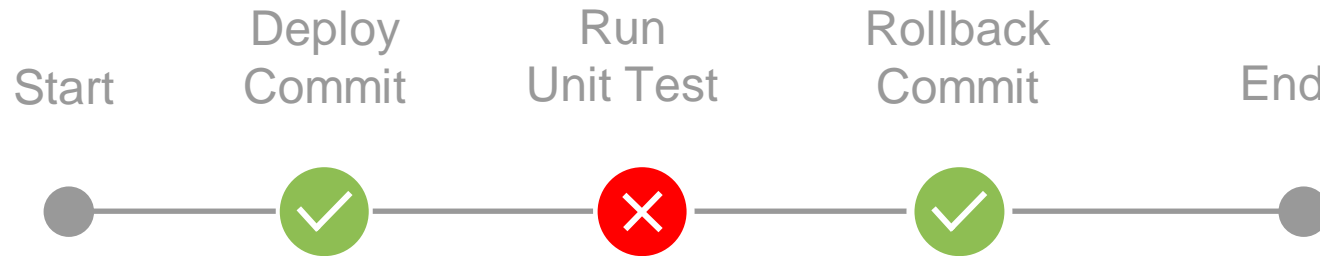


Demo



The steps in Project 'Piper'

Project 'Piper' – available Steps



Library Steps in Project ,[Piper](#)' – can be used with SAP S/4HANA 2020 and later

[gctsCloneRepository](#)

[gctsCreateRepository](#)

[gctsDeploy](#)

[gctsExecuteABAPUnitTests](#)

[gctsRollback](#)

gCTSDeploy (Revised)

gCTSDeploy-Step

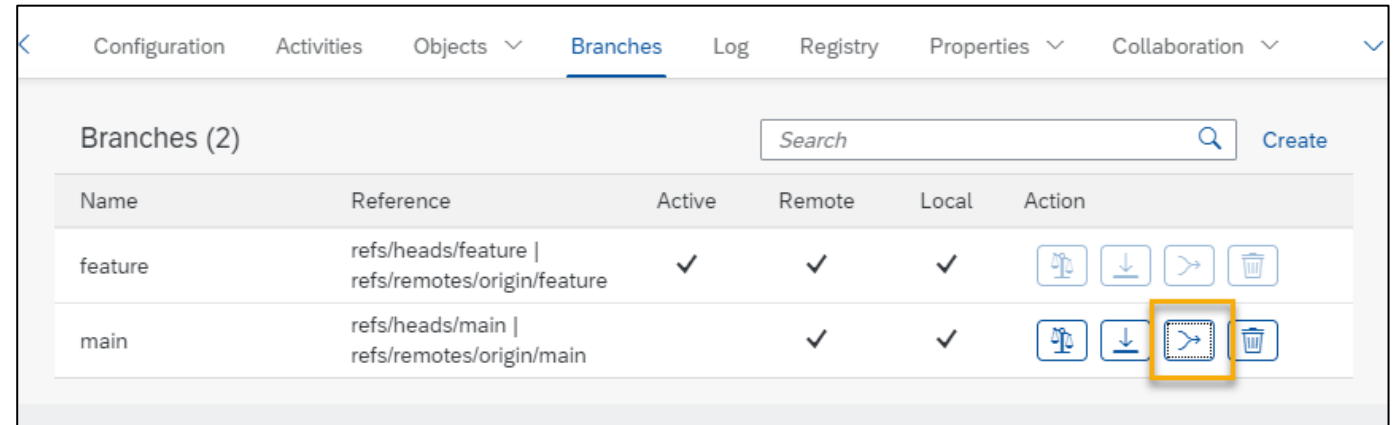
- Extended functionality
 - Creates & clones the repository if it does not exist
→ gCTSCreateRepository & gCTSCloneRepository are not needed any more
 - Can set a certain branch active
 - Can set repository parameters
 - Can set a defined commit as active (or latest)
 - Can execute a rollback
- Can be used from SAP S/4HANA 2020 onwards









Merge process and conflict resolution

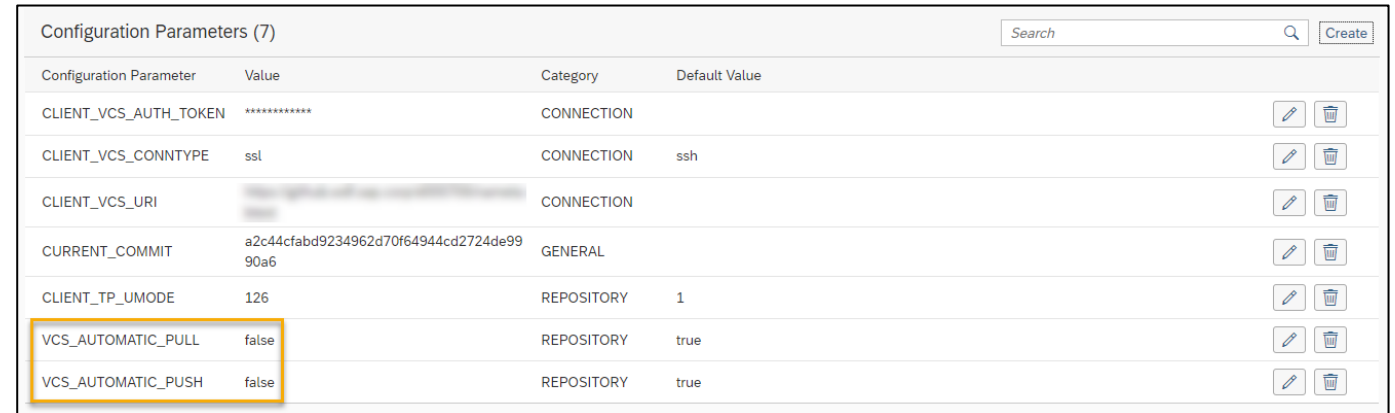
Merge branches

Merge branches on the local repository on the Branches tab of the gCTS app

- Merge the selected branch into the active branch
- Parameters 'VCS_AUTOMATIC_PULL' and 'VCS_AUTOMATIC_PUSH' need to be set to false



Configuration Activities Objects ▾ Branches Log Registry Properties ▾ Collaboration ▾ ▾						
Branches (2) Search Create						
Name	Reference	Active	Remote	Local	Action	
feature	refs/heads/feature refs/remotes/origin/feature	✓	✓	✓	   	
main	refs/heads/main refs/remotes/origin/main		✓	✓	   	

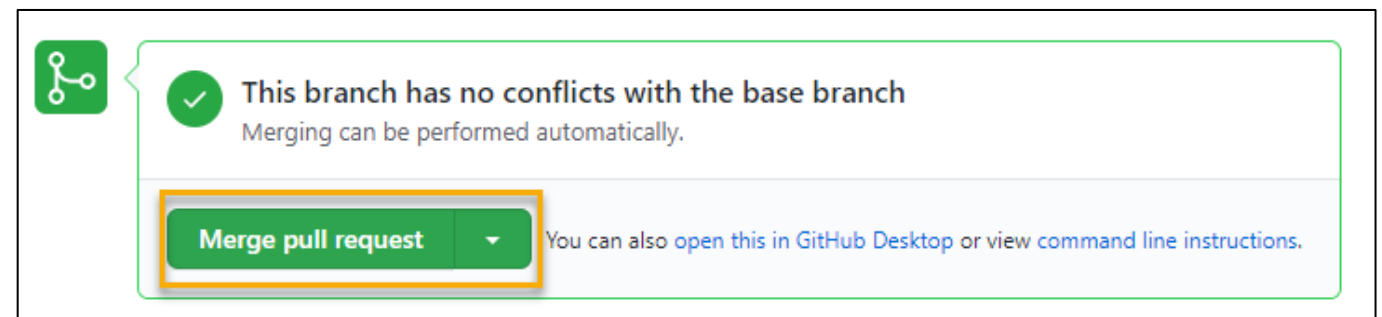
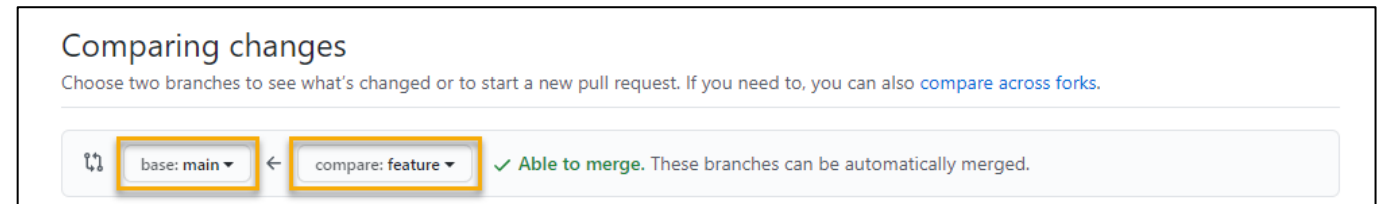
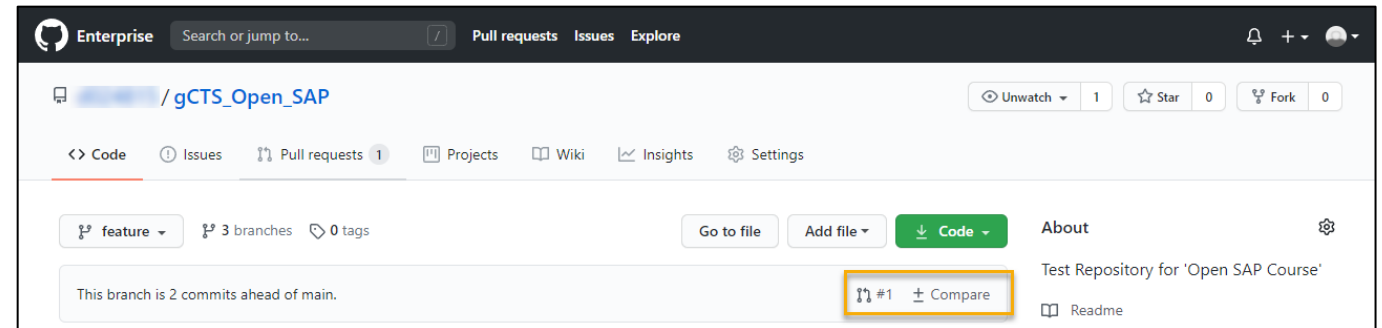


Configuration Parameters (7) Search Create			
Configuration Parameter	Value	Category	Default Value
CLIENT_VCS_AUTH_TOKEN	*****	CONNECTION	
CLIENT_VCS_CONNTYPE	ssl	CONNECTION	ssh
CLIENT_VCS_URI		CONNECTION	
CURRENT_COMMIT	a2c44cfabd9234962d70f64944cd2724de9990a6	GENERAL	
CLIENT_TP_UMODE	126	REPOSITORY	1
VCS_AUTOMATIC_PULL	false	REPOSITORY	true
VCS_AUTOMATIC_PUSH	false	REPOSITORY	true

Merge branches

Merge branches on the remote repository by using a pull request on GitHub









- Compare branches and create a pull request
- Select the branches to be merged into each other
- Merge the pull request



Merge Process – Tools Involved: Merge on Branches Tab

- Merge selected branch into active
- Choose Merge Strategy and decide about Fast Forward Option – defaults should be a good start
- Parameters VCS_AUTOMATIC_PULL and VCS_AUTOMATIC_PUSH need to be set to false

The screenshot shows the 'Branches' tab in the SAP GUI. It contains a table with two branches: 'feature' and 'main'. The 'feature' branch is active. Below the table, a 'Merge Branch' dialog is open, showing the 'Merge Strategy' set to 'Recursive (Default)' and the 'Fast Forward Option' set to 'Fast Forward (Default)'. The 'Merge Branch' button is highlighted.

Name	Reference	Active	Remote	Local	Action
feature	refs/heads/feature refs/remotes/origin/feature	✓	✓	✓	   
main	refs/heads/main refs/remotes/origin/main		✓	✓	   

Merge Branch

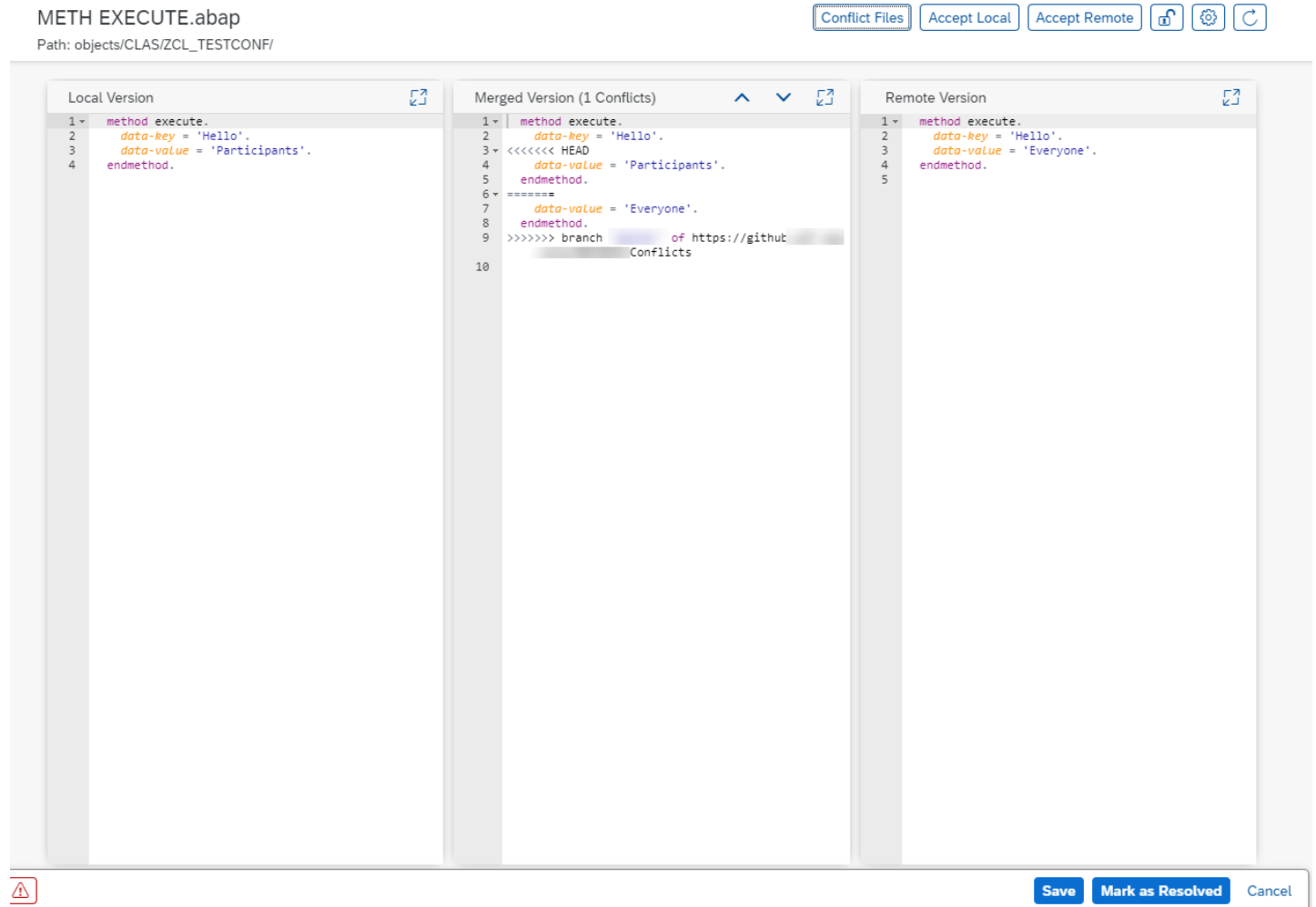
Merge Strategy:
Recursive (Default)

Fast Forward Option:
Fast Forward (Default)

Merge Branch Close

Merge Process – Tools Involved: Conflict resolution editor

- Integrated in 'Objects' tab of the gCTS app
- Shows local and remote version
- Shows merged version indicating conflicts
- Merged version requires editing
- Uses GitHub-API to load remote version



Conflict resolution in gCTS

- Requires SAP S/4HANA 2020
- Can only happen if you stop automatic pull and push
- Is done on the 'Objects' tab of the gCTS app. From there the 'gCTS conflict resolution editor' is launched

The screenshot displays the 'Objects' tab in the SAP gCTS application. The interface includes a top navigation bar with tabs: Commits, Configuration, Activities, Objects (selected), Branches, Log, and Properties. The main content area is divided into sections: 'Current Objects' (empty), 'Conflicting Files' (containing one item: 'objects/CLAS/ZCL_HELLO/' with name 'METH EXECUTE.abap' and type 'abap'), and 'Local Files' (containing one item: 'Tracked Files (0)'). A 'Push (1)' button is visible next to the 'Local Files' section. Below the main content area, a table shows the status of various objects, with two rows highlighted in orange:

Object Name	Repository	Status
VCS_AUTOMATIC_PULL	REPOSITORY	false
VCS_AUTOMATIC_PUSH	REPOSITORY	false

Conflict resolution in gCTS – enhanced Commit option

Commit Files

All files are committed to the local repository. These files refer to objects in the ABAP system that were not merged so far or were changed in a different way. Do you want to trigger an import of merged files into the system? This could result in data loss since changed objects could be overwritten.

☒ Reimport committed files

The following objects are related to the files that you want to commit and that are already locked in various transport requests in the ABAP system or that were locked by other users because of the 'edit' mode in ADT/SE80.

Type	Object	Transport	User
No data			

Commit

Cancel

Import & Activate files into development system

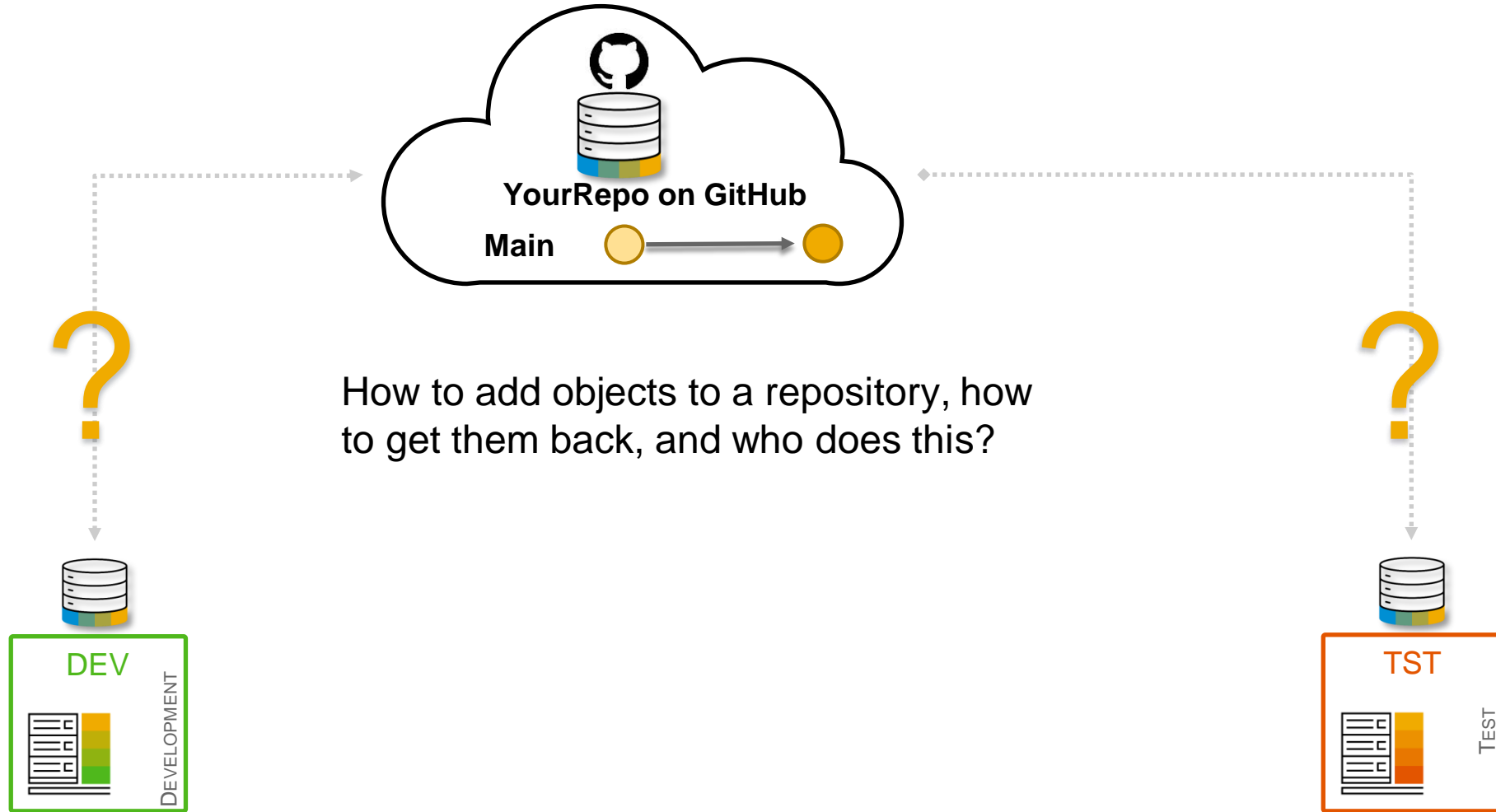
- Version with resolved conflicts is available in Dev systems
- Any uncommitted changes done in Dev in the meantime are lost

Demo

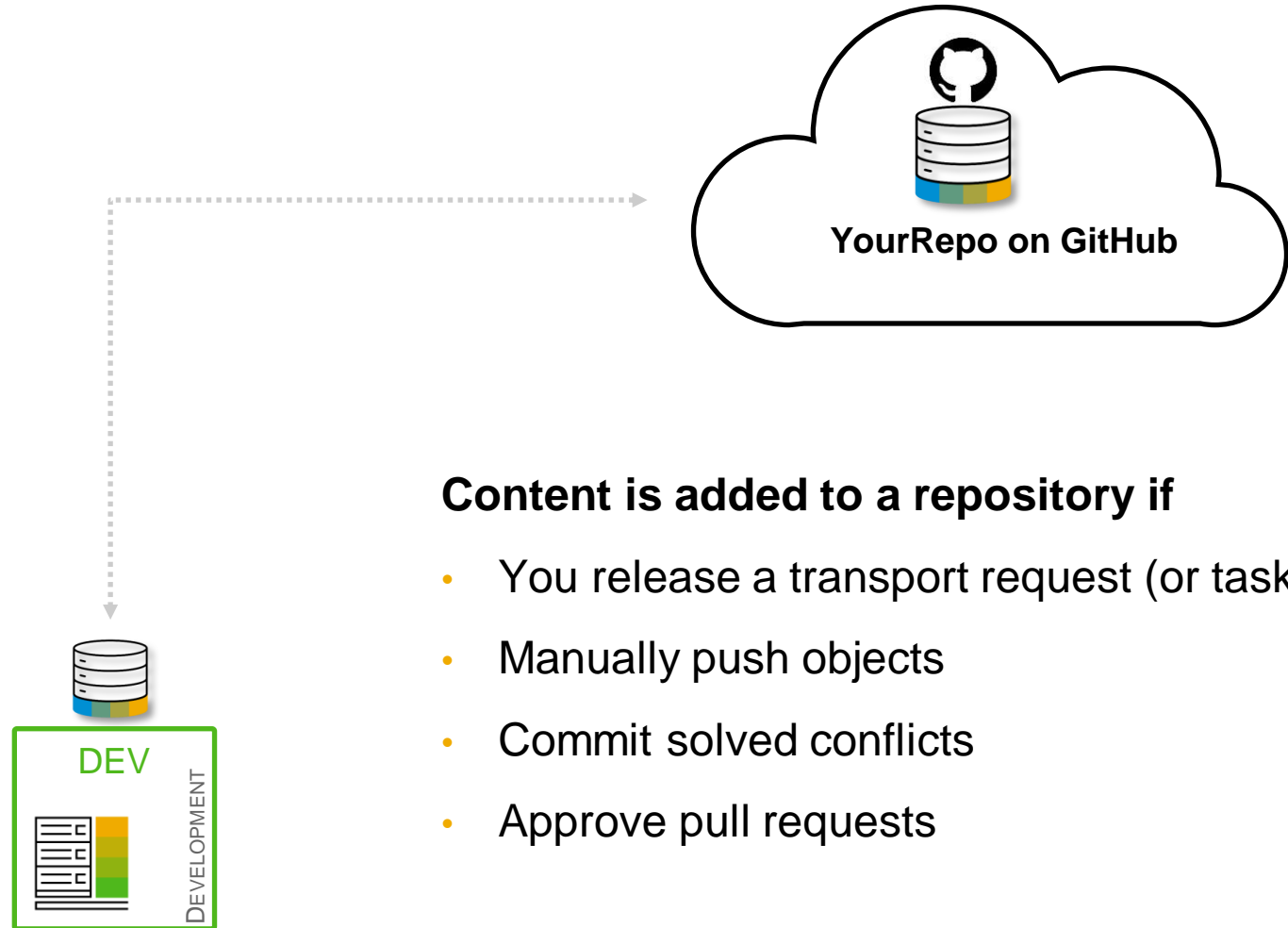


Deployment Options

What this is about



Fill your repository



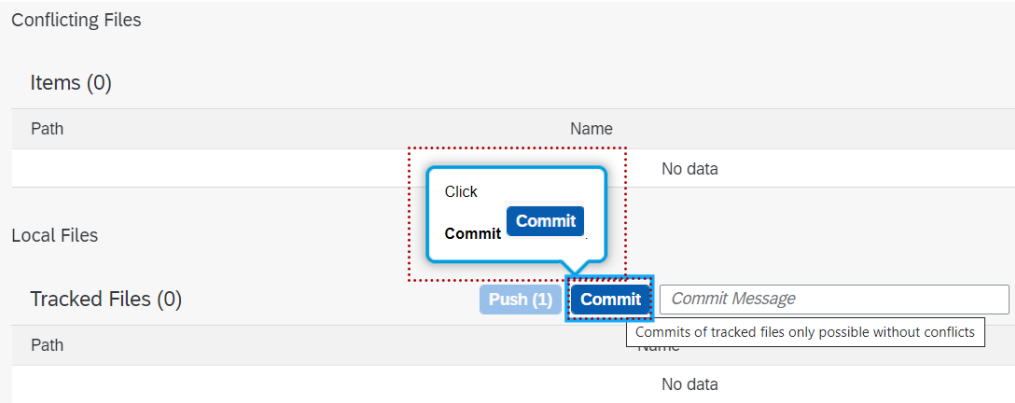
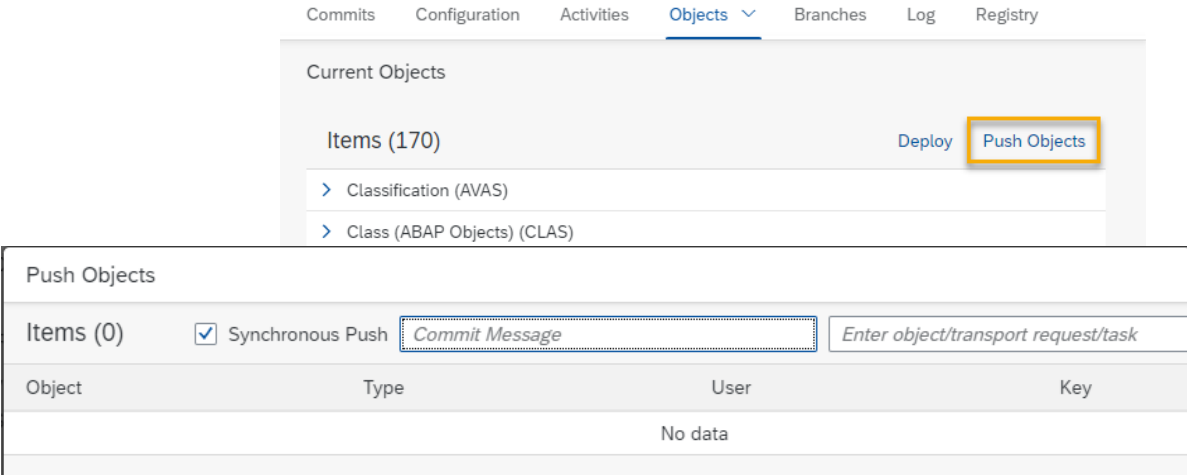
Require special action to add back into ABAP Runtime

X

X

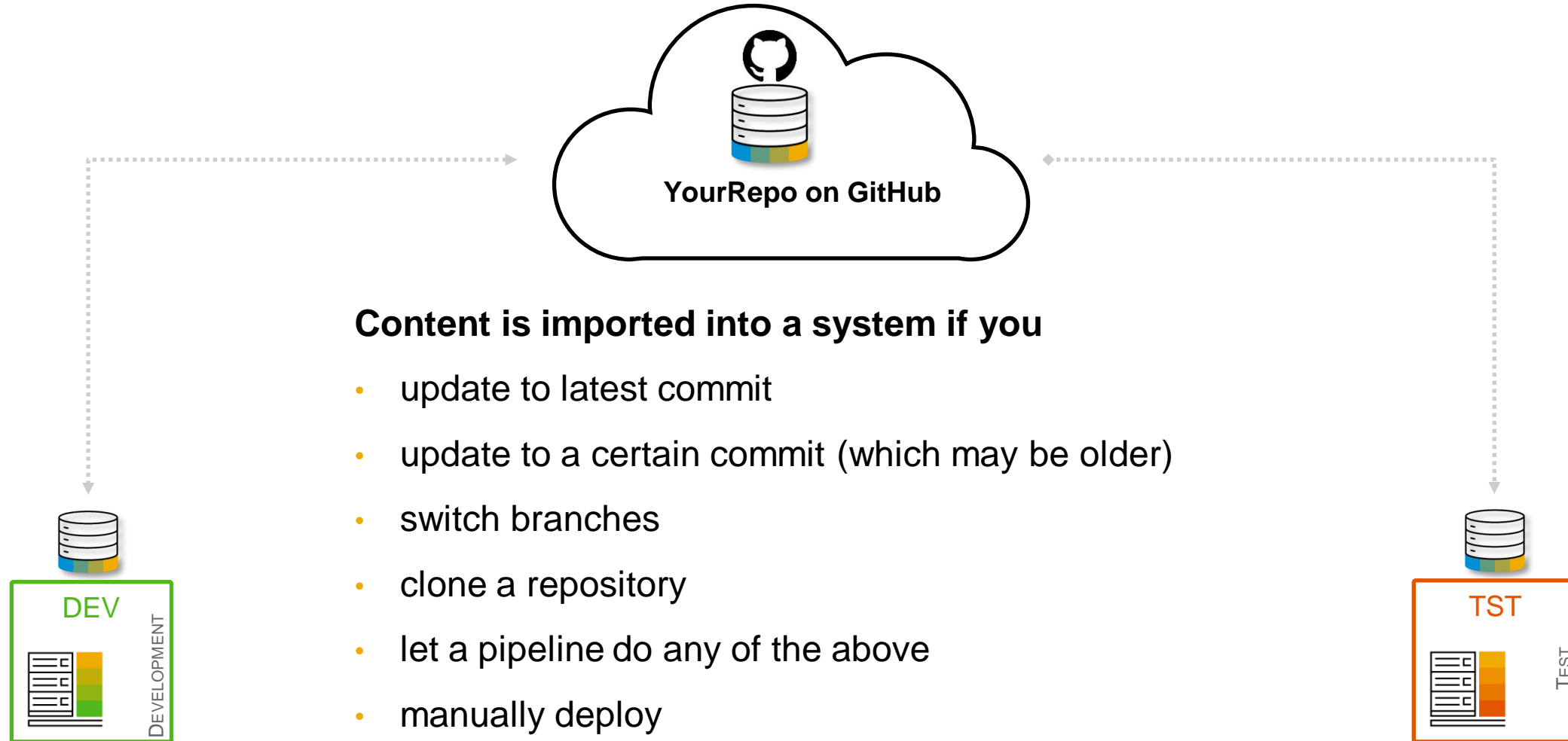
Initiate pushes in gCTS App

On the objects tab, you can push individual objects, packages or content of transport requests

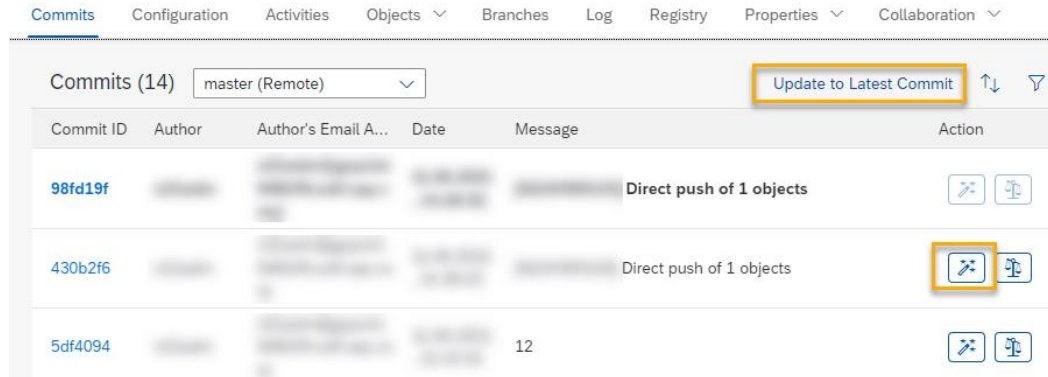


When you solved a conflict, you need to push and commit the changed objects

Pull objects to a target system

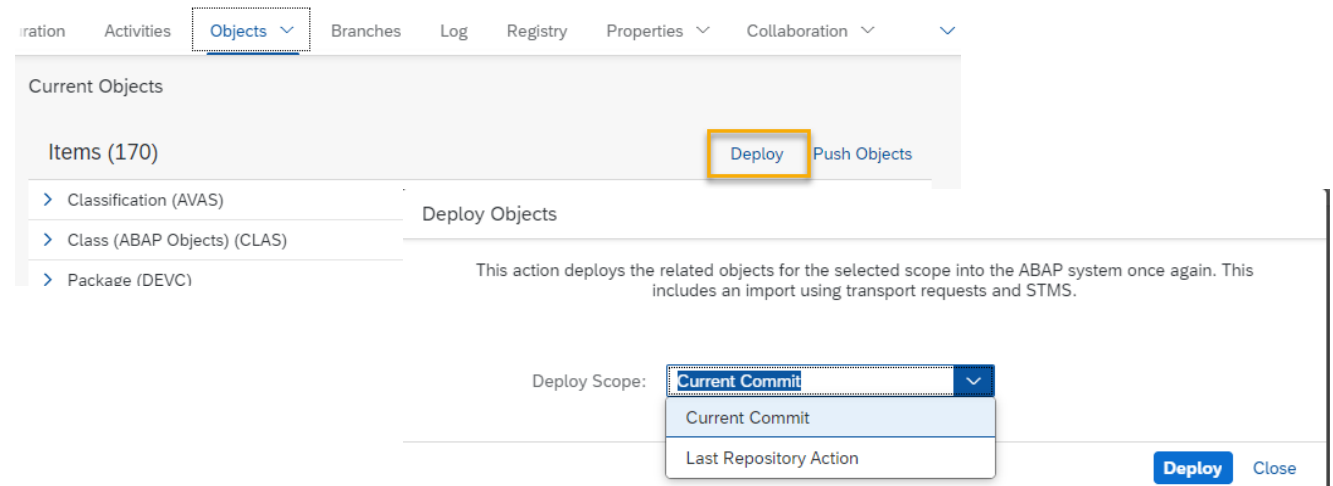


Initiate deployment in gCTS App



On the Commits tab, you can switch between commits or update to latest – this will initiate import of transport requests.

Initiate deployment on objects tab: Can deploy either the current commit or re-do the last repository action Can e.g. be used to import customizing in different clients



Thank you.

Contact information:

Karin Spiegel

Product Management

karin.spiegel@sap.com

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