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

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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...

Development

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

When pushing

DEV

ObjA
ObjB
ObjC

A, B, C

ANY

ObjA → RepoA
ObjB → RepoB
ObjC → RepoA

A, C

B

RepoA
ObjA
ObjC

RepoB
ObjB

gCTS registry is an option to centrally assign objects and packages to repositories
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
The steps in Project ‘Piper’
Project ‘Piper’ – available Steps

Start | Create Repository | Clone Repository | End

Start | Deploy Commit | Run Unit Test | Rollback Commit | End

Start | Deploy Commit | Run Unit Test | Rollback Commit | End

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
**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
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
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.

<table>
<thead>
<tr>
<th>Type</th>
<th>Object</th>
<th>Transport</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>No data</td>
<td></td>
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</tr>
</tbody>
</table>

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
Deployment Options
What this is about

How to add objects to a repository, how to get them back, and who does this?
Fill your repository

Content is added to a repository if

- You release a transport request (or task)
- Manually push objects
- Commit solved conflicts
- Approve pull requests

Require special action to add back into ABAP Runtime

YourRepo on GitHub
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

Content is imported into a system if you

- update to latest commit
- update to a certain commit (which may be older)
- switch branches
- clone a repository
- let a pipeline do any of the above
- manually deploy
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.

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