

Unit 7 – Developing with SAP Extension Suite

Certification: [C_CPE_13](#)

Unit 7 – Automated Deployment

Agenda

- What have we learned so far
- Continuous Integration and Delivery
- Configuring CI / CD job
- Stages of CI / CD Pipeline
- Verifying build success

Steps involved

1. Initialize full-stack project – Completed (Unit 1, 2)
2. Create the tables – Data Modeling – Completed (Unit 1, 2)
3. Generic handlers – Out-of-the-box CRUD functionality – Completed (Unit 1, 2)
4. Basic UI – Completed (Unit 3)
5. List Report layout – Completed (Unit 3)
6. Custom event handling – Business logic – Completed (Unit 3)
7. Support for external API – Completed (Unit 4)
8. Connecting to Sandbox – Completed (Unit 4)

Steps involved

9. Consume external service in UI – Completed (Unit 4)
10. Manual deployment to CF using manifest.yml – Completed (Unit 5)
11. Manual deployment to CF using mta.yml – Completed (Unit 5)
12. Security – Restrictions and Roles – Completed (Unit 6)
13. Security – Authorization & Trust Management – Completed (Unit 6)
14. Creating an AppRouter – Completed (Unit 6)
15. Adding AppRouter to mta – Completed (Unit 6)
16. CI / CD Pipeline

Continuous Integration / Delivery - Deployment

Continuous Integration:

- Developers push code to main code line at least once a day
- Automated central build and tests are triggered upon each push
- Team ensures stable build and test quality all the time

Continuous Delivery:

- Software is ready for deployment to productive system all the time
- Deployment to productive system is **triggered manually**
- Feedback from productive system gets integrated to teams' backlog

Continuous Deployment:

- Deployment to productive system is **triggered with each commit (automatic)**

Enabling SAP Continuous Integration and Delivery

Task 1 – Create / Administer Continuous Integration and Delivery Service:

- Create a subscription of Continuous Integration and Delivery
- Add **CICD Service Administrator** role collection

Task 2 – Configure Credentials:

- GitHub Credentials
- Cloud Foundry credentials

Task 3 – Configure GitHub Repository:

The screenshot shows the 'Add Repository' configuration page in the SAP Continuous Integration and Delivery interface. The page has two tabs: 'General Information' (selected) and 'Webhook Event Receiver'. The 'General Information' tab contains the following fields:

- Name:** risk-management-repo
- Clone URL:** https://github.tools.sap/ /risk-management-testing.git
- Credentials:** github (selected from a dropdown menu)
- Cloud Connector:** (empty dropdown menu)

The 'Webhook Event Receiver' tab is also visible and contains the following fields:

- Type:** GitHub (selected from a dropdown menu)
- Webhook Credential:** <GENERATE> (selected from a dropdown menu)
- State:** ON (indicated by a blue toggle switch)

At the bottom right of the page, there are two buttons: 'Add' (highlighted with a red box) and 'Discard'.

Configuring CI / CD job

Task 1 – Configure a job:

Create Job ?

General Information ▼

*Job Name:

*Repository:

*Branch:

Pipeline: ?

Version:

State: ☒ ON


BUILD RETENTION

*Keep logs for: days

*Keep maximum: build items

STAGES

Configuration Mode: i

 risk-management-repo

General Information ▼

?

Webhook Creation ?

Navigate to the GitHub repository [risk-management-repo](#) and add webhook manually using the data below if not yet done. A webhook enables the repository to start builds.

Webhook Data

Payload URL: 📄

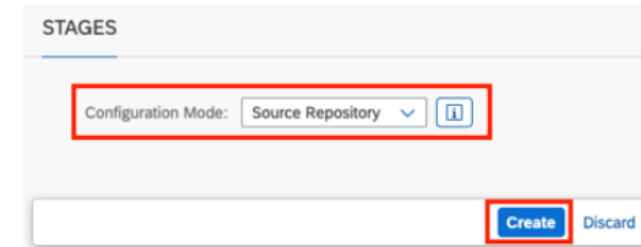
Content type:

Secret: 📄

Configuring stages of the CI / CD Pipeline

Steps done so far:

- Connected SAP Continuous Integration and Delivery Service to GitHub
- Created a job for automated build



Steps to do:




- `cds add pipeline`
- Update `.pipeline/config.yml`

Configuring stages of CI / CD pipeline




```
  cnsopload: false
steps:
  cloudFoundryDeploy:      .pipeline/config.yml
    cloudFoundry:
      apiEndpoint: "https://[REDACTED].com" # please verify if this is your API endpoint.
      org: "[REDACTED]trial" # add your org here
      space: "dev" # add your space here
      credentialsId: "cfdeploy"
      appName: ""
      mtaDeployParameters: "-f --version-rule ALL"
  artifactPrepareVersion:
    versioningType: "cloud_noTag"
```


Verifying Build Success


Jobs (1) Repositories (1) Credentials (4)

Search   


Name	State	Branch	Pipeline
risk-management-repo			
risk-management-job	ON	main	SAP Cloud Application Programming Model




risk-management-job   

 Repository risk-management-repo Server https://github.tools.sap
Pipeline
SAP Cloud Application Programming Model




 Builds


#1

 Commit 82d6e5c
12 sec · Jul 8, 2021, 5:35:21 PM


  



GENERAL INFORMATION

risk-management-job   

 Builds

#2

 Commit 31da7ab
11 min 37 · Jul 8, 2021, 5:42:30 PM

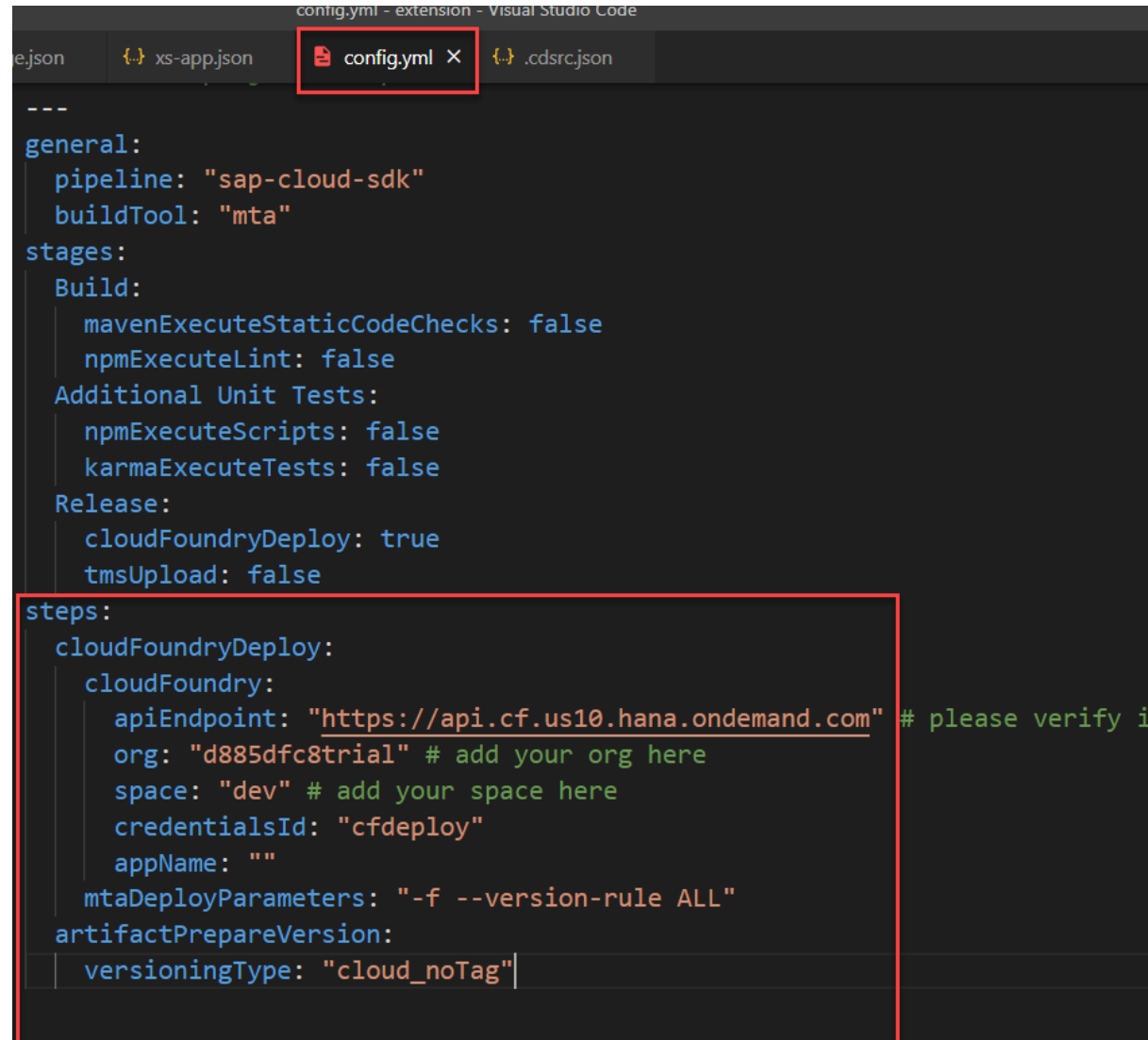
 

Key Summary Points – Unit 7

cds add pipeline

New Files

- Jenkinsfile
- .pipeline/config.yml



```
---
general:
  pipeline: "sap-cloud-sdk"
  buildTool: "mta"
stages:
  Build:
    mavenExecuteStaticCodeChecks: false
    npmExecuteLint: false
  Additional Unit Tests:
    npmExecuteScripts: false
    karmaExecuteTests: false
  Release:
    cloudFoundryDeploy: true
    tmsUpload: false
steps:
  cloudFoundryDeploy:
    cloudFoundry:
      apiEndpoint: "https://api.cf.us10.hana.ondemand.com" # please verify i
      org: "d885dfc8trial" # add your org here
      space: "dev" # add your space here
      credentialsId: "cfdeploy"
      appName: ""
    mtaDeployParameters: "-f --version-rule ALL"
  artifactPrepareVersion:
    versioningType: "cloud_noTag"
```

Key Summary Points – Unit 7

The screenshot displays the SAP BTP Cockpit interface. The left sidebar contains navigation links for Overview, Services, Cloud Foundry, HTML5 Applications, Connectivity, Security, Entitlements, and Usage Analytics. The main content area is titled 'Subaccount: trial - Instances and Subscriptions' with a 'Create' button. Below this is an information banner and filter controls. The 'Subscriptions (9)' tab is selected, showing a table of applications subscribed to the subaccount. The 'Continuous Integration & Delivery' application is highlighted with a red box. The table includes columns for Application, Plan, Created On, Changed On, and Status.

SAP BTP Cockpit

Trial Home / d885dfc8trial / trial

Subaccount: trial - Instances and Subscriptions
All: 30

To manage the Cloud Foundry user-provided service instances, navigate to Cloud Foundry - Spaces, select your space, and then from Services select Service Instances.

Search All Services All Plans All Statuses

Subscriptions (9) Instances (20) Environments (1)

Applications to which your subaccount is currently subscribed

Application	Plan	Created On	Changed On	Status	
Product List MTA	default	17 Jan 2022	10 Apr 2022	Unsubscription Failed	...
Continuous Integration & Delivery	trial	10 Apr 2022	10 Apr 2022	Subscribed	...
Document Information Extraction Trial UI	default	26 Jan 2022	26 Jan 2022	Subscribed	...
Integration Suite	trial	17 Feb 2022	17 Feb 2022	Subscribed	...
SAP Business Application Studio	trial	17 Nov 2021	17 Nov 2021	Subscribed	...
Launchpad Service	standard	6 Jan 2022	24 Feb 2022	Subscribed	...
Web Analytics	standard	17 Nov 2021	17 Nov 2021	Subscribed	...
Subscription Management Dashboard	application	17 Jan 2022	17 Jan 2022	Subscribed	...
Workflow Management	saas-application	6 Jan 2022	6 Jan 2022	Subscribed	...

Key Summary Points – Unit 7

The screenshot displays the SAP BTP Cockpit interface. On the left, the navigation menu has 'Security' and 'Users' highlighted with red boxes. The main area shows the 'Subaccount: trial - Users' page, also highlighted with a red box. It features a table of users and a right-hand pane for role collections.

Subaccount: trial - Users

Search: [Search] Last Updated: [All] Hasn't Logged On: [All]

User Name	Identity Provider	Last Name	First Name	E-Mail	Last Updated	Last Logon	Actions
milton.chandradas@sap.com	Default identity provider	Chandras	Milton	milton.chandradas@sap.com	17 Nov 2021, 23:31:55 (GMT-05:00)	24 Apr 2022, 02:10:02 (GMT-04:00)	[Delete] [More]

Role Collections

Search: [Search] Assign Role Collection [More]

Name	Description	Action
Business_Application_Studio_Developer	Allows developers to load and develop applications using SAP Business Application Studio.	[Delete] [More]
CICD Service Administrator	Administrator Role Collection for the Continuous Integration & Delivery Service	[Delete] [More]
Document_Information_Extraction_UI_Admin_User_trial	A role collection containing the Document_Information_Extraction_UI_Admin_User_trial Role Template.	[Delete] [More]
Integration_Provisioner_Auto	For provisioning and basic configuration of the Integration capabilities	[Delete] [More]
ProductListViewer	Product List Viewer	[Delete] [More]
RiskManager-dev	Manage Risks	[Delete] [More]
SAP Web Analytics Customer Admin	Customer Admin	[Delete] [More]
Subaccount Administrator	Administrative access to the subaccount	[Delete] [More]
Web Analytics	Contains roles	[Delete] [More]

Key Summary Points – Unit 7

Question 1

Choose the correct answer(s).



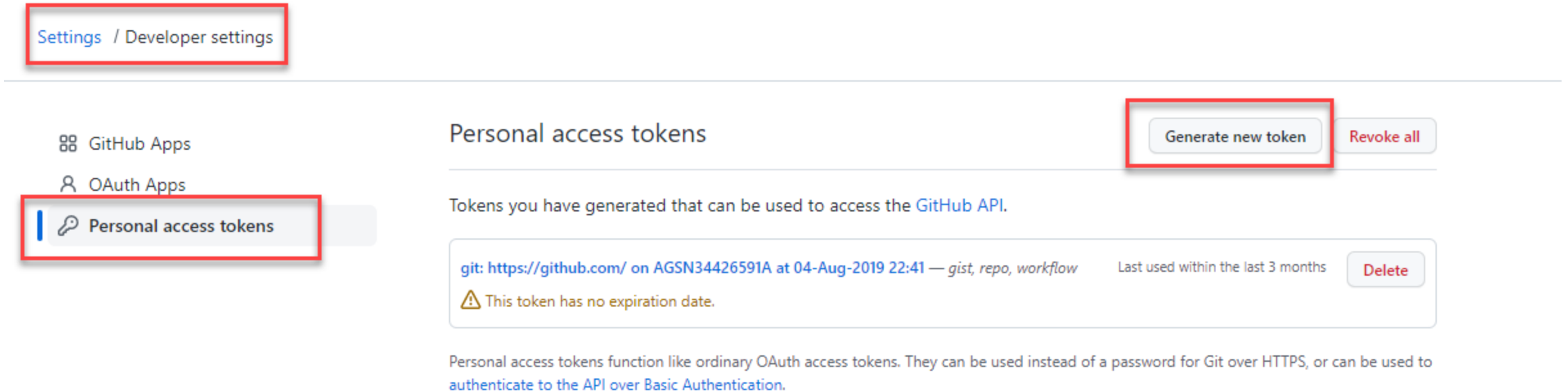
Which of the following statements about a GitHub Repository are correct?

- ☒ Anyone on the internet can see a public repository.
- ☐ Anyone on the internet can commit into a public repository.
- ☒ You choose who can see your private repository.
- ☒ You choose who can commit into your private repository.

Feedback

Correct. Anyone on the internet can see a public repository. You choose who can see your private repository. You choose who can commit into your private repository.

Key Summary Points – Unit 7



The screenshot shows the GitHub Developer Settings interface. On the left sidebar, the 'Settings / Developer settings' breadcrumb is at the top. Below it are three menu items: 'GitHub Apps', 'OAuth Apps', and 'Personal access tokens', which is highlighted with a red box. The main content area is titled 'Personal access tokens' and has a 'Generate new token' button (highlighted with a red box) and a 'Revoke all' button. Below the title, it says 'Tokens you have generated that can be used to access the GitHub API.' There is a table with one token entry: 'git: https://github.com/ on AGSN34426591A at 04-Aug-2019 22:41 — gist, repo, workflow'. To the right of this entry is 'Last used within the last 3 months' and a 'Delete' button. Below the table, a warning icon and text state 'This token has no expiration date.' At the bottom, a paragraph explains that Personal Access Tokens function like ordinary OAuth access tokens and can be used instead of a password for Git over HTTPS or to authenticate to the API over Basic Authentication.

Settings / Developer settings

GitHub Apps

OAuth Apps

Personal access tokens

Personal access tokens

Generate new token

Revoke all

Tokens you have generated that can be used to access the GitHub API.

git: <https://github.com/> on AGSN34426591A at 04-Aug-2019 22:41 — gist, repo, workflow

Last used within the last 3 months

Delete

⚠ This token has no expiration date.

Personal access tokens function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to authenticate to the API over Basic Authentication.

Personal Access Tokens are an **alternative to using passwords** for authentication to GitHub when using the GitHub API or command line

GitHub automatically removes Personal Access Tokens that haven't been used in a year

Key Summary Points – Unit 7

Question 4

Choose the correct answer.

What does the source code management system use to trigger the CI server?

- ☒ Webhooks
- ☐ Web services
- ☐ HTTP PUT requests

Feedback

Correct. The source code management system uses Webhooks to trigger the CI server.

Key Summary Points – Unit 7

Continuous Integration:

- Developers push code to main code line at least once a day
- Automated central build and tests are triggered upon each push
- Team ensures stable build and test quality all the time

Continuous Delivery:

- Software is ready for deployment to productive system all the time
- Deployment to productive system is **triggered manually**
- Feedback from productive system gets integrated to teams' backlog

Continuous Deployment:

- Deployment to productive system is **triggered with each commit (automatic)**

Key Summary Points – Unit 7

SAP Continuous Integration and Delivery

Jobs (1) Repositories (1) **Credentials (3)**

Search [] [] []

Name	Description	Type	Actions
cfdeploy		Basic Authentication	[] []
github		Basic Authentication	[] []
risk-management-repo	Webhook token for repository 'risk-management-repo'	Webhook Secret	[] []

Key Summary Points – Unit 7

Question 10

Choose the correct answer.

What is a "main line" in a source control management system used for?

- ☐ To automate deployment.
- ☐ To enable a reporting line for the project manager.
- ☒ To make developers' contribution transparent and avoid clashes.

Submit

Key Summary Points – Unit 7

Question 10

Choose the correct answer.

What is a "main line" in a source control management system used for?

- ☐ To automate deployment.
- ☐ To enable a reporting line for the project manager.
- ✓ ☒ To make developers' contribution transparent and avoid clashes.

Submit

Question 11

Determine whether this statement is true or false.

A main line in a source control management system can contain feature branches.

- ✓ ☒ True
- ☐ False

Submit

Key Summary Points – Unit 7

Question 12

Choose the correct answer(s).

What are the differences between continuous integration (CI) and continuous delivery (CD)?

- ✓ ☒ CI allows team members to add their changes to a main line.
- ✓ ☒ CD adds an aspect that changes have been tested successfully.
- ☐ CI allows developers to integrate their contributions any time.
- ☐ CD adds an aspect that changes are immediately ready for deployment.

Submit

Key Summary Points – Unit 7

Question 13

Choose the correct answer.

What do you use to retrieve the information about a change on the repository?

- ☐ A change document
- ✓ ☒ A webhook
- ☐ A PUT request to GitHub

Question 15

Choose the correct answer.

What kind of request does the webhook send?

-  ☐ GET
- ☐ PUT
- ✓ ☒ POST

Key Summary Points – Unit 7

To get you started quickly, ^Tproject "Piper" offers you the following artifacts:

- A set of ready-made Continuous Delivery pipelines for direct use in your project
- [ABAP Environment Pipeline](#)
- [General Purpose Pipeline](#)
- [A shared library](#) that contains reusable step implementations, which enable you to customize our preconfigured pipelines, or to even build your own customized ones
- A standalone [command line utility](#) for Linux and a [GitHub Action](#)
- Note: This version is still in early development. Feel free to use it and [provide feedback](#), but don't expect all the features of the Jenkins library
- A set of [Docker images](#) to setup a CI/CD environment in minutes using sophisticated life-cycle management

Key Summary Points – Unit 7

The screenshot displays the SAP Continuous Integration and Delivery (CI/CD) interface. The left pane shows the 'Jobs (1)' tab selected, with a table listing the 'risk-management-job'. The right pane shows the 'Builds' tab for the 'risk-management-job', displaying a list of builds with their status and commit details.

SAP Continuous Integration and Delivery

Jobs (1) Repositories (1) Credentials (3)

Search

Name	State	Branch	Timed Triggers	Pipeline
risk-management-repo				
risk-management-job	ON	master	0	SAP Cloud Application Programming Model 1.0

risk-management-job Edit Copy Delete

Repository: risk-management-repo Server: https://github.com
Pipeline: SAP Cloud Application Programming Model

Builds General Information Build Retention Stages Timed Triggers

Manually trigger build

#3
Commit 5d5a0b3
6 min 22 · Apr 22, 2022, 6:52:39 PM
Retrigger Delete

#2
Commit ab69e92
10 min 06 · Apr 21, 2022, 10:47:52 PM
Retrigger Delete

GENERAL INFORMATION