

# **SAS Fans Trondheim and Tromsø**

**SAS Migration strategies to SAS Viya4 from SAS 9.4**

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# SAS Content Migration

## Steps

- Run SAS Content Assessment
- Export content from SAS 9.4
- Prepare target environment - SAS Viya4
  - Create Mappings, Configure Environments etc.
- Import content to SAS Viya4
  - Scripted import – demo
  - Manual import – demo
- Unit test
  - Need to test imported content
- Validate content
  - Validation means check for data consistency and results are alike as SAS 9.4

# New Import Interface

Import  
Interface

Import tab  
for import.

Mapping Set  
tab to manage  
mappings

Can selectively  
import

- Select source package
- Perform Mapping
- Preview and Import
- View Results

The screenshot displays the SAS New Import Interface. On the left is a navigation menu with options: Data, Servers, Content, Users, **Import** (highlighted), Licensed Products, Configuration, Contexts, User-Defined Formats, MONITOR, Logs, and Metrics. The main area has two tabs: 'Import' (active) and 'Mapping Sets'. Under the 'Import' tab, there are sub-sections: 'Source', 'Mapping', 'Preview', and 'Results'. The 'Source' section shows an 'Import file:' field with 'all\_gelcorp\_sep2020.spk'. Below it, a 'Content' section has a 'View:' dropdown set to 'All resources'. A list of items is shown with checkboxes: 'DataSupport' (checked), 'Finance\_Analysis' (checked), 'Finance\_Analysis\_V2' (checked), 'finance\_dijob\_1' (unchecked), and 'Finance\_map1' (checked). An arrow points from the 'Can selectively import' callout to the 'DataSupport' item. On the right, a 'Properties' panel for 'Finance\_map1' shows details: Name: Finance\_map1, Description: (empty), ID: A5ELUBD6.AX00007C, Type: InformationMap.Relational, and Original location: /gelcorp/financecontent/DataSupport/. An 'Import' button is in the top right corner.

# Mapping Interface

A central aspect of importing is the creation, refinement, and application of mappings. Mappings govern the transformation of exported resources for use in the target environment.

The screenshot shows the SAS Mapping Interface. On the left is a sidebar with navigation links: Import, Mapping Sets, Source, Mapping (selected), Preview, and Results. The main area is titled 'Mapping' and has tabs for Content, Users and Groups, Tables (selected), Properties, and Other. A 'Mapping set:' dropdown is set to 'System default' with a 'Save' button. Below these is a table with columns: Source, Target Server, Target Caslib, Target Table, and Exists. The 'Source' column lists three folders: /gelcorp/salescontent/Data/Reporting Data, /gelcorp/salescontent/Data/Source Data, and /gelcorp/salescontent/Data/Lasr Data. The 'Target Server' column has a dropdown menu currently showing 'cas-shared-default'. The 'Target Caslib' and 'Target Table' columns are empty. The 'Exists' column shows a green checkmark for the first row and red X marks for the others. Four blue callout boxes with arrows point to specific interface elements: 'Four categories of Mapping' points to the 'Tables' tab; 'Mapping Sets can be loaded from and Saved to the Infrastructure Data Server' points to the 'Mapping set:' dropdown; 'Mappings can be edited interactively' points to the 'Source' column; and an unlabeled callout points to the 'Target Server' dropdown.

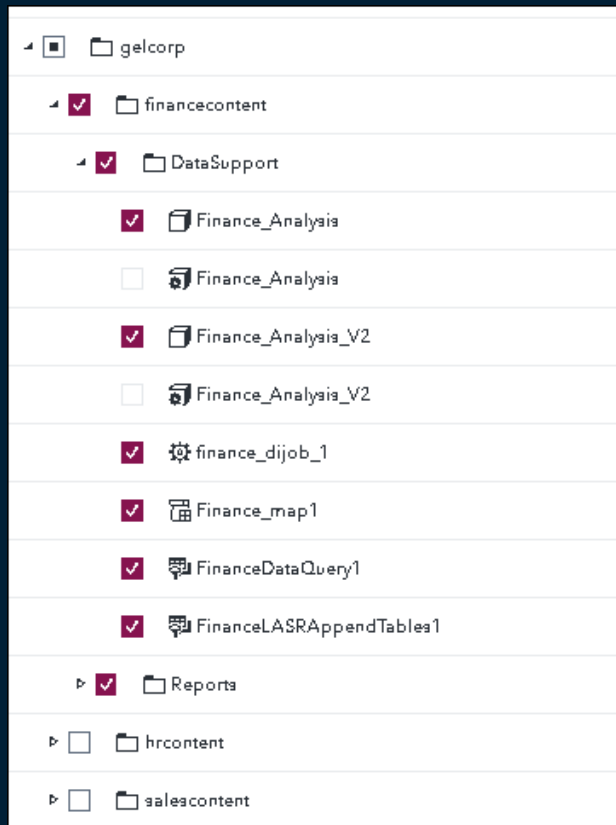
Four categories of Mapping

Mapping Sets can be loaded from and Saved to the Infrastructure Data Server

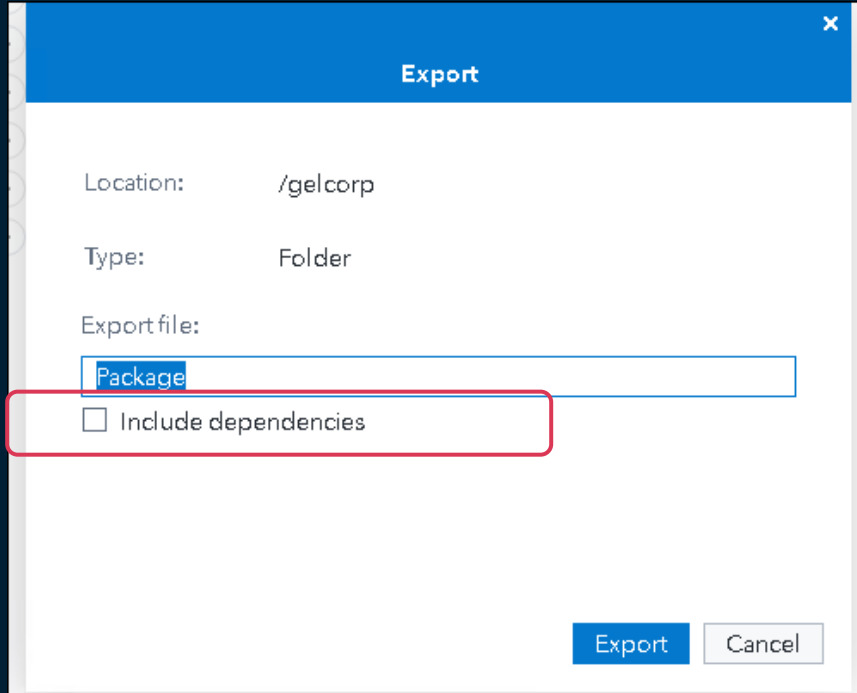
Mappings can be edited interactively

Source	Target Server	Target Caslib	Target Table	Exists
└─ /gelcorp/salescontent/Data/Reporting Data	cas-shared-default			✓
└─ /gelcorp/salescontent/Data/Source Data				✗
└─ /gelcorp/salescontent/Data/Lasr Data				✗

# Selective Import of Content



## 2021.2.1 Include Dependencies



Export

Location: /gelcorp

Type: Folder

Export file:

Package

☐ Include dependencies

Export Cancel

```
sas-viya transfer export  
-u /folders/folders/82e2f89b-a53e-4c74-b8d0-de5ab3049acc  
--include-dependencies
```

# Relocate Content During Import

SAS® Environment Manager - Manage Environment

**Import**

Import Mapping Sets

Source  
Mapping  
Preview  
Results

**Mapping**

Content Users and Groups Tables Properties Other

Target location: /ConvertedEGPProjects

ConvertedEGPProjects

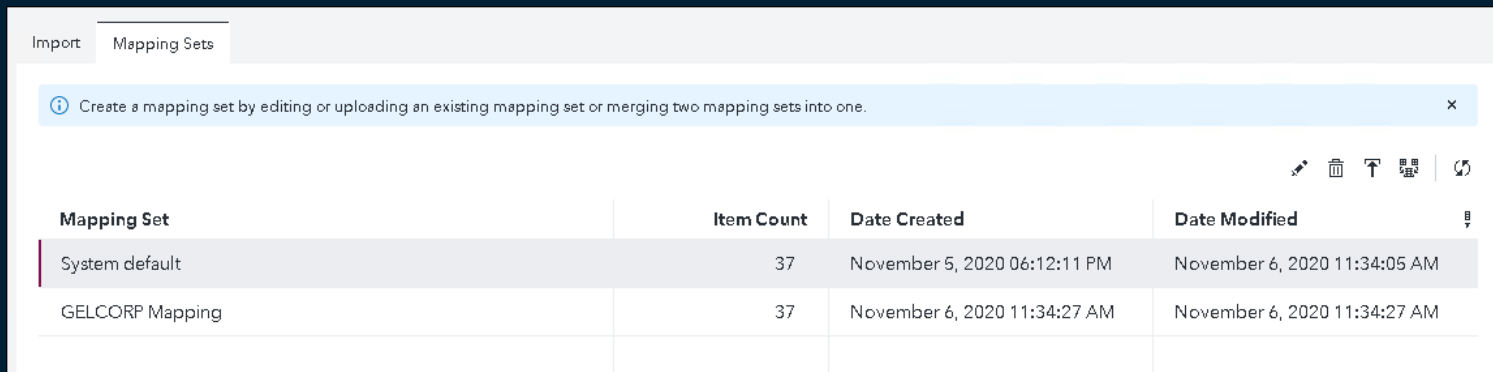
No items are available.

Specify target  
location.

# Mapping Set Interface

Mapping Sets can be managed separately from the import process:

- Loaded and Saved from/to the Infrastructure Data Server
- Uploaded from a JSON File
- Edited
- Merged
- Deleted



The screenshot shows the 'Mapping Sets' tab in a software interface. At the top, there are two tabs: 'Import' and 'Mapping Sets'. Below the tabs is a light blue banner with an information icon and the text: 'Create a mapping set by editing or uploading an existing mapping set or merging two mapping sets into one.' To the right of the banner are icons for edit, delete, add, and refresh. Below the banner is a table with the following data:

Mapping Set	Item Count	Date Created	Date Modified
System default	37	November 5, 2020 06:12:11 PM	November 6, 2020 11:34:05 AM
GELCORP Mapping	37	November 6, 2020 11:34:27 AM	November 6, 2020 11:34:27 AM



# SAS Libraries

## Viya Compute libraries can now be:

- Defined in the resources section of Viya Compute Contexts
- Managed in SAS Studio
- Assigned automatically when compute sessions start.
- Created when importing V9 path-based SAS libraries.

The screenshot displays the SAS Environment Manager interface. On the left is a navigation pane with a tree view containing: SYSTEM, Data, Servers, Content, Users, Import, Licensed Products, Configuration, Contexts (highlighted), User-Defined Formats, Features, MONITOR, and Jobs and Flows. The main area is titled 'Contexts' and shows a list of contexts under the 'Compute contexts' view. The 'SAS Studio compute context' is highlighted. An 'Edit Compute Context' dialog is open, showing the 'Resources' tab. This tab contains a table with columns: Name, Assign, and Use Default Libref. The table lists several SAS libraries, some of which are assigned and use default librefs.

	Name	Assign	Use Default Libref
<input type="checkbox"/>	FINDATA Financial Data - Base SAS I/O Engine	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> FINDATA
<input type="checkbox"/>	hrdata HR Data - Base SAS I/O Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/> hrdata
<input type="checkbox"/>	sdeptdat Sales Reporting Library - Base SAS I/O Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/> sdeptdat
<input type="checkbox"/>	sharedl Shared Data - Base SAS I/O Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/> sharedl
<input type="checkbox"/>	slsdata Sales Data - Base SAS I/O Engine	<input type="checkbox"/>	<input checked="" type="checkbox"/> slsdata

# SAS Libraries

On Import V9 SAS Libraries can now create both a CAS Library and a Compute Library

Import to CAS and Compute

Mapping

Content Users and Groups Tables **Properties** Other

Mapping set: System default ? Save

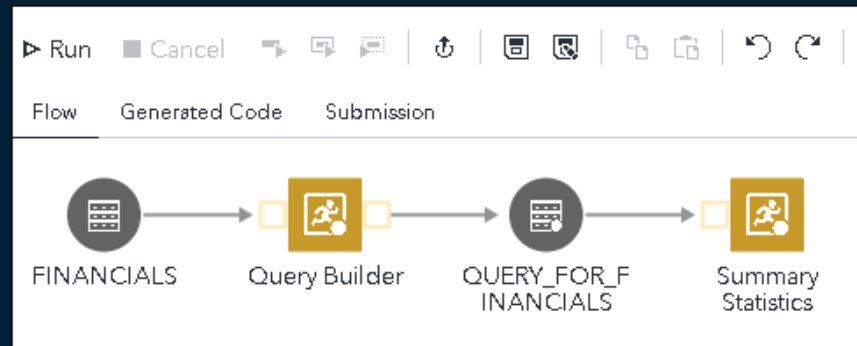
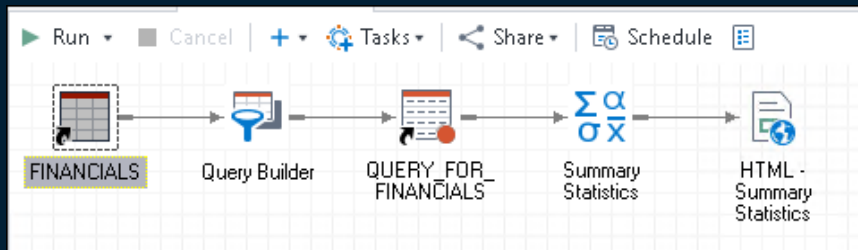
Resources & Properties	Old Value	New Value
Financial Data		
DirPath	/gelcontent/gelcorp/finance/data	/gelcontent/gelcorp/finance/data
CASServer		cas-shared-default
ImportTargetEnvs	CAS, Compute	CAS, Compute
ComputeContexts	SAS Studio compute context, SAS Job Execution compute context	SAS Studio compute context, SAS Job Execution compute context

Select Compute Contexts to Create Library

# Enterprise Guide Project to Studio Flow

## What Happens

Each process flow is converted to a SAS Studio Flow

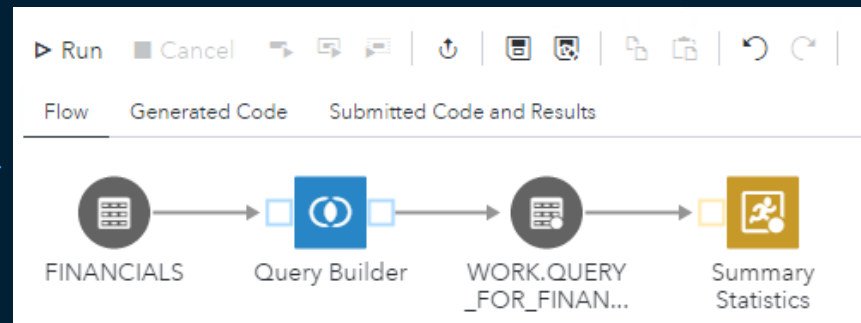
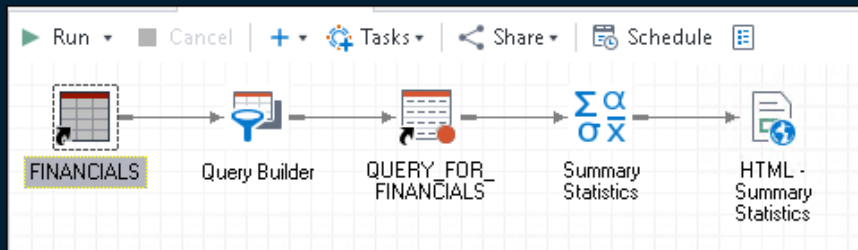


Resultant studio flows may often require some changes to be fully functional.

# Enterprise Guide Project to Studio Flow

## What Happens

Each process flow is converted to a SAS Studio Flow



Resultant studio flows may often require some changes to be fully functional.

# Enterprise Guide Tasks

- Many Enterprise Guide tasks are migrated to SAS Program Nodes in SAS Studio.
- Some EG tasks
  - Are migrated to the equivalent node in Studio e.g., Query, Data, Append, Filter, Sort etc.
  - are not supported because there is no equivalent in Viya e.g., Update Library Metadata
  - require manual updates of the resulting program node e.g., Create Format from Dataset

Future development will add support for migration of tasks to nodes with equivalent functionality.

# Enterprise Guide Projects

Projects from Enterprise Guide 7 and 8 are supported.

- **Individual Projects** can be imported directly using Environment Manager or the transfer plugin of the sas-viya CLI.
- **Multiple projects** can be imported in batch with a CLI delivered with Content Assessment
  - Use Content Assessment csv output and imports all Projects in a csv file
  - OR all Projects in a directory path.



# Enterprise Guide Migration strategy

- Enterprise Guide projects are often spread across
  - Network Shares/disks
  - PC
  - Metadata
  - other
- Need to allow users to import own projects
- Can do bulk load from mounted disk to Viya4
- As mentioned – Folder structure, libraries and data needs to be available to end-users

# Enterprise Guide Projects

- Scripted import
  - Different approaches
- Enterprise Guide Projects that is scanned from CodeCheck Application can be used as input to migration tool
- Enterprise Guide Projects can be imported from Specific folder directly



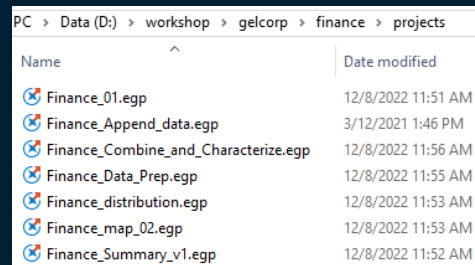


# Enterprise Guide Projects

- Scripted import – [demo](#)
- SAS Content Assessment creates a list for scanned projects
  - List of SAS Enterprise Guide Project.csv
- # import EG projects based on input csv – using CodeCheck report data
  - cd /drives/d/workshop/SAS9ContentAssessment/migration/
  - ./importEGProjects.exe --sas-viya-path "D:\\ViyaHome\\CLI\\sas-viya.exe" --source-file "C:\\Users\\student\\Downloads\\List of SAS Enterprise Guide Project.csv" --root-folder "/EGProjects/Scripted"
- # import EG project that is placed in Specific folder
  - ./importEGProjects.exe --sas-viya-path "D:\\ViyaHome\\CLI\\sas-viya.exe" --source-location "D:\\workshop\\gelcorp\\shared\\projects" --root-folder "/EGProjects/Specific"

## # Environment URL

- <https://target.pdcex02203.race.sas.com/SASStudio>



The screenshot shows a Windows File Explorer window with the address bar displaying the path: PC > Data (D:) > workshop > gelcorp > finance > projects. The window contains a table with two columns: 'Name' and 'Date modified'. The 'Name' column lists several files with a blue icon, and the 'Date modified' column shows the corresponding dates and times.

Name	Date modified
Finance_01.egg	12/8/2022 11:51 AM
Finance_Append_data.egg	3/12/2021 1:46 PM
Finance_Combine_and_Characterize.egg	12/8/2022 11:56 AM
Finance_Data_Prep.egg	12/8/2022 11:55 AM
Finance_distribution.egg	12/8/2022 11:53 AM
Finance_map_02.egg	12/8/2022 11:53 AM
Finance_Summary_v1.egg	12/8/2022 11:52 AM

# Enterprise Guide Migration strategy

- **Scripting** means:
  - Repeatability
- **GIT** Integration:
  - Version control of migrated content and scripts
- Use **Pipelines** to automate the migration:
  - **Azure** have Pipeline capabilities meaning we can create an automation of migration steps.
  - **Gitlab** has this functionality also

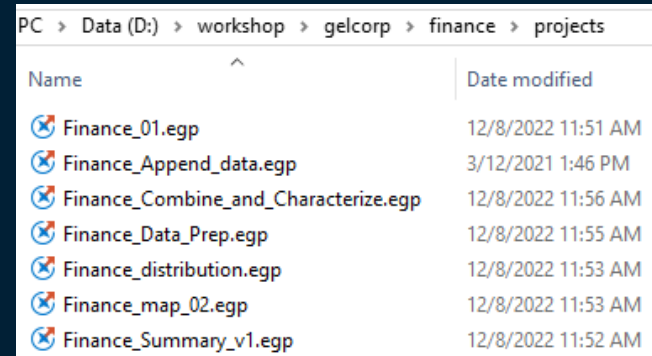
Lars Arne will talk more on the topic with CI/CD capabilities

# Enterprise Guide Projects

## Manual import

### – Manual import – demo

- Import will add content to SAS Viya4 from an SAS EGP project
- You need to use Environment Manager
- Can be done without administrative user-rights



The screenshot shows a Windows File Explorer window with the address bar displaying the path: PC > Data (D:) > workshop > gelcorp > finance > projects. The main area shows a list of files with columns for Name and Date modified. Each file icon is a blue circle with a white 'X' and a red 'X'.

Name	Date modified
Finance_01.egp	12/8/2022 11:51 AM
Finance_Append_data.egp	3/12/2021 1:46 PM
Finance_Combine_and_Characterize.egp	12/8/2022 11:56 AM
Finance_Data_Prep.egp	12/8/2022 11:55 AM
Finance_distribution.egp	12/8/2022 11:53 AM
Finance_map_02.egp	12/8/2022 11:53 AM
Finance_Summary_v1.egp	12/8/2022 11:52 AM



# Migration Summary Report

## Migration Summary Report



Enterprise Guide Migration Activity

Data Integration Studio Migration Activity

SAS Studio Step Details

Summary by Step Type description

Migration Timeline

Filters: Project.EG \* Finance\_01.egp; Process Flow; Project.EG \*

This report page shows details on a per-node basis about whether resulting steps have been successfully migrated into SAS Studio.

Project.EG	Successfully Migrated (9)	Needs Attention (3)	Steps Not Migrated (3)
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SAS 9 Source Name	OriginalType	SAS Studio Flow Name	Total Number of Steps	Studio Step Type	Steps Not Migrated
Finance_01.egp	Project.EG	Process Flow	15	SAS Enterprise Guide Task	0
Finance_02.egp	Project.EG	Process Flow	10	SAS Enterprise Guide Query	0
Finance_Append_data.egp	Project.EG	Process Flow	5	Registered Table	0
Finance_Combine_and_Characterize.egp	Project.EG	Process Flow	14	ODS Result	3
Finance_Data_Prep.egp	Project.EG	Process Flow 1	5	Data	0
Finance_Data_Prep.egp	Project.EG	Process Flow	6		
Finance_distribution.egp	Project.EG	Process Flow	9		

ImportedTimeStamp	SAS 9 Source Name	SAS Studio Flow Name	Studio Step Name	Studio Step Type	Studio Migration Result
2021-06-01T19:38:33.665Z	Finance_01.egp	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:44:41.582Z	Finance_01.egp	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:47:25.004Z	Finance_01.egp	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:38:33.665Z	Finance_01.egp	Process Flow	HTML - Choropleth Map	ODS Result	Step Omitted
2021-06-01T19:44:41.582Z	Finance_01.egp	Process Flow	HTML - Summary Statistics	ODS Result	Step Omitted
2021-06-01T19:47:25.004Z	Finance_01.egp	Process Flow	HTML - Summary	ODS Result	Step Omitted

### Studio Migration Details

Path update needed.

### Studio Migration Hint

Referenced SAS programs are converted to SAS program nodes with a %INCLUDE statement pointing to the file location. The referenced SAS program needs to be made available to the SAS Viya software. Either place the file in a mounted location or place it in a file system that is accessible by the deployment.

# Summary

- SAS 9 content can be migrated to Viya4
- Scripted migration approach is supported
  - DevOps and CI/CD would be beneficiary due to repeatability
- Manual migration is supported
- No need for administrative user-rights to-do import
- R&D are working to support migration of SAS 9 content to Viya 4 even better
- Needs some planning and structure
  - Decide what to migrate
  - Decide what not to migrate
- Content need to be in place to make a successful migration for end-users.