



# Content Migration from SAS 9.4 to SAS Viya4

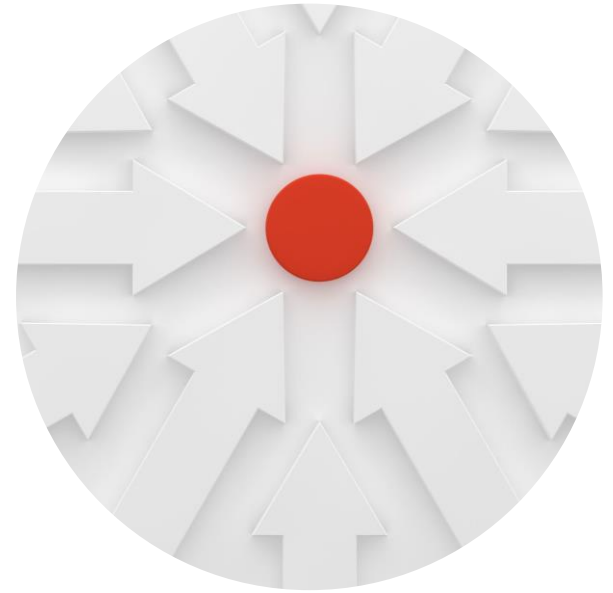
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Iowa SAS User Group Conference 2024

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# Objectives

- Introduction
  - Review some terminologies
  - Discuss migration support functionality in Viya 4
- Migratable objects
  - Review what content can be migrated from SAS 9.4 to Viya
  - Discuss how content is converted
  - Cover future development plans.
- Planning and executing the migration
  - Discuss the planning step of the content migration process.
  - Introduce the Content Assessment Utility.
  - Review the features of Content Assessment applications
  - Create and review Content Assessment reports.





# Introduction

- What is migration
-

# Migration

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- Migration is moving data and content from one environment to another. This could include moving to the same or a new version of the software.



## migration

[mɪˈɡræʃ(ə)n] 🔊

NOUN

1. seasonal movement of animals from one region to another.

"this butterfly's annual migration across North America"

*synonyms:* relocation · resettling · population movement · transhumance · moving · [more]

- movement of people to a new area or country in order to find work or better living conditions.

"the extensive rural-to-urban migration has created a severe housing shortage"

2. movement from one part of something to another.

"there is virtually no cell migration in plants"

# Forms of Migration

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- Migration can mean moving from:
  - One server to another
  - One Operating System or Platform to another
  - One application to another
  - One version of an application to another
  - On-Premise to the Cloud
  - Data from one place to another
  - Content from one place to another

# Migration to Viya

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- There are two approaches to migration to Viya 4.
  - **Content migration** is the process of copying content within and between deployments
  - **Full system migration** is the process of creating a new deployment that preserves the configuration and content from an existing deployment.

## Tools and Supported Baselines

<b>Approach</b>	<b>Tools</b>	<b>Source</b>	<b>Notes</b>
<b>Content Migration</b>	Export/Import	9.4, 3.4, 3.5 and 4	Support for content types varies by release.
<b>Full System Migration</b>	Playbook Backup/Restore	3.4 and 3.5	
	Backup/Restore	4	

# Content Migration

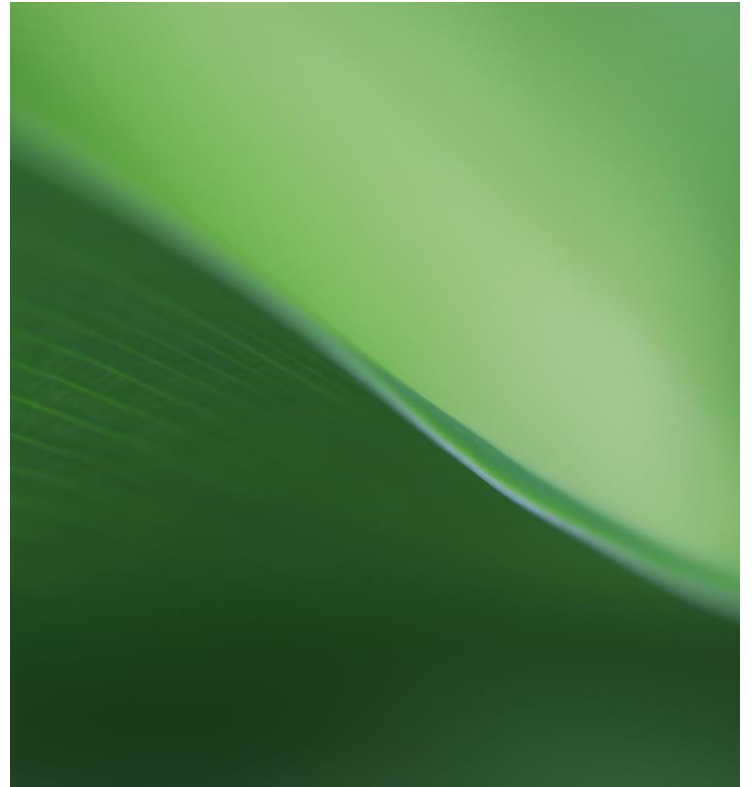
Content migration is the process of copying content between deployments



Export content from source



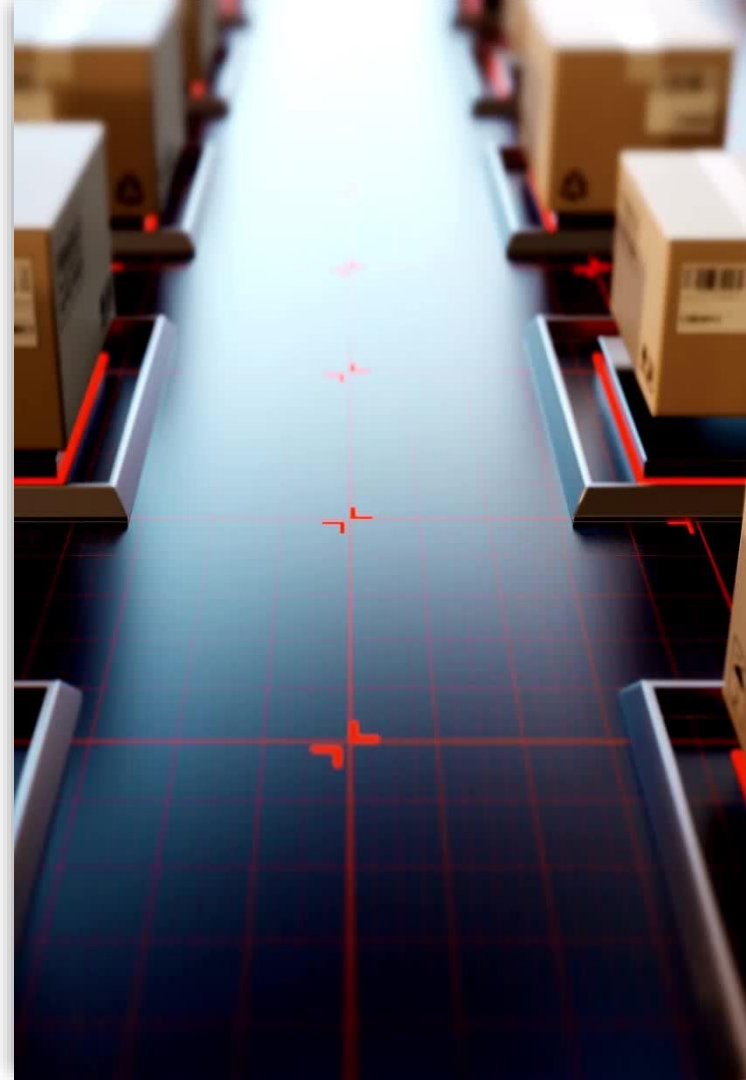
Import content to target.





# When to Use Content Migration?

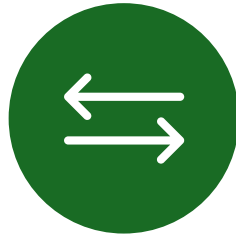
- Export/Import is a key method for moving configuration and content.
- This approach is mainly used to move content between environments e.g., in DEV/TEST/PROD environments
- To save and restore content in a containerized environment
- As a method of creating selective backups
- When customers transition from 9.4 to Viya or Viya to Viya.



# High Level Process Overview



PLAN



PREPARE



MIGRATE



VALIDATION



# Content Migration Interfaces

In SAS Viya 4

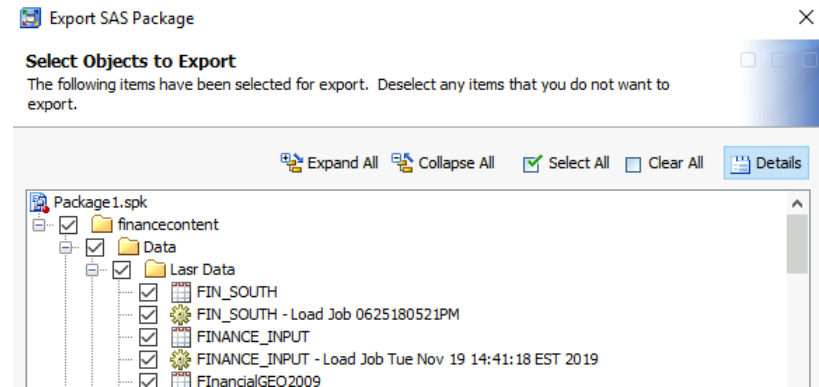
# Packages

## SAS 9.4 Packages :

- Are .spk files created and stored in a directory in the operating system
- Can be opened and viewed in zip file utilities
- Contain other files that represent the exported content

# Tools for Export

- You can export from SAS 9.4 using
- SAS Management Console **Export Wizard**
- SAS Platform Object Framework **ExportPackage** tool
- Content Assessment **CreateSASPackages**.



# Export Process

- Viya content has inherent dependencies during the import. Dependent objects must exist in the target environment so that connections can be re-established.
- Export SAS 9.4 content in separate packages by type of resource to support the import process.
- Some content requires dependent objects to be available in the package.

Identities

Libraries

Tables

Reports

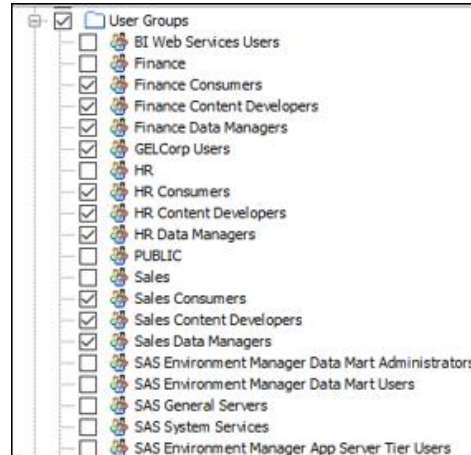
# Identities

## Groups

When exporting identities,

directly from the **Security** folders in SAS 9.4 to a separate package

**do not** include other content in the package.



# Excluding groups from Export

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The documentation says:

*“During promotion, SAS 9 metadata identities that also exist in LDAP are excluded because SAS Viya does not keep its own copy of that information.”*

If you **do not** export groups from 9.4 that exist in LDAP CAS authorization **is not** created on import.

If you **do** export groups from 9.4 that exist in LDAP you get an error for those groups during import. The error can be ignored.



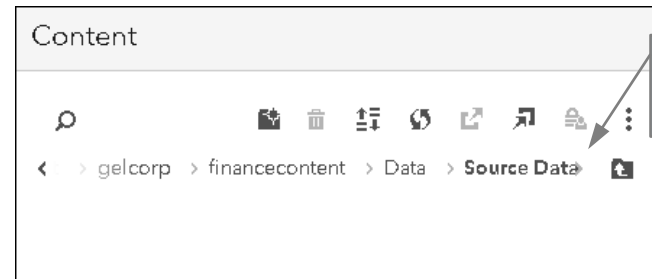
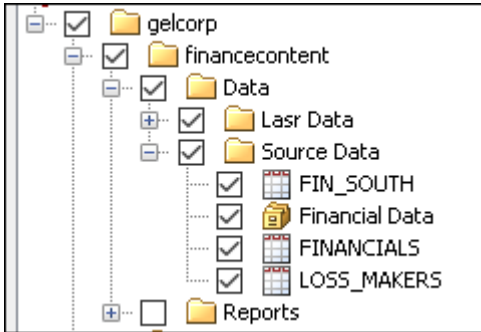


# Data Definitions

## Tables and Libraries

Export:

- LASR and Base libraries and tables directly from the library. (This prevents extraneous folders being created in the target environment.)
- Libraries in a separate package from tables so that
  - libraries can be imported before tables.



empty folder

# Content Assessment

## Export Applications

- ***createSASPackages*** creates SAS packages for the specified SAS metadata objects.
- ***createFARPackages.exe*** creates SAS Forecast Server archives from Forecast Server projects.
- ***createSASGridImportData*** gathers SAS Grid Server metadata and formats it into JSON files.
- ***createEMBatchCode*** creates SAS Enterprise Miner batch code.

# Export Applications

## Requirements

- SAS Intelligence Platform Object Framework 9.4 must be installed.
- JRE 1.7.0 or greater
- SAS middle tier installed
- SAS Content Server installed

# Bulk Export

## createSASPackages

Creates SAS packages using output from Content Assessment (CSV)

- **Data Integration jobs** from the SAS<sup>®</sup>9 Profile for Data Integration report
- **Stored processes** from the SAS<sup>®</sup>9 Code Check for SAS Stored Processes report

```
createSASPackages.exe --source-file "C:\myjobs\Jobs ready for migration or not.csv"
```

Output to  
directory

Name	Date modified	Type	Size
Finance_profit_by_ToyandNovelty_ExportPackage.log	6/6/2022 4:44 PM	Text Document	2 KB
Finance_profit_by_ToyandNovelty.spk	6/6/2022 4:44 PM	SPK File	15 KB
Finance_profit_by_product_ExportPackage.log	6/6/2022 4:44 PM	Text Document	2 KB
Finance_profit_by_product.spk	6/6/2022 4:44 PM	SPK File	13 KB
finance_dijob_1_ExportPackage.log	6/6/2022 4:44 PM	Text Document	2 KB
finance_dijob_1.spk	6/6/2022 4:44 PM	SPK File	42 KB

One package  
per object

# Generate Content Mapping

To promote custom groups and membership information, run the ***sas-viya transfer generate-content-mapping*** command before running the Import Wizard.

Mapping file ContentMappings.json is written to the specified path.

```
graph TD; A[read in the package files exported from SAS 9.4] --> B[sas-viya transfer generate-content-mapping --mapping c:\temp --user-package identities.spk --group-package identities.spk --server-package servers.spk]; B --> C[Mapping file ContentMappings.json is written to the specified path.]
```

```
sas-viya transfer generate-content-mapping --mapping c:\temp  
--user-package identities.spk --group-package identities.spk  
--server-package servers.spk
```

read in the package files  
exported from SAS 9.4

# Import Interface

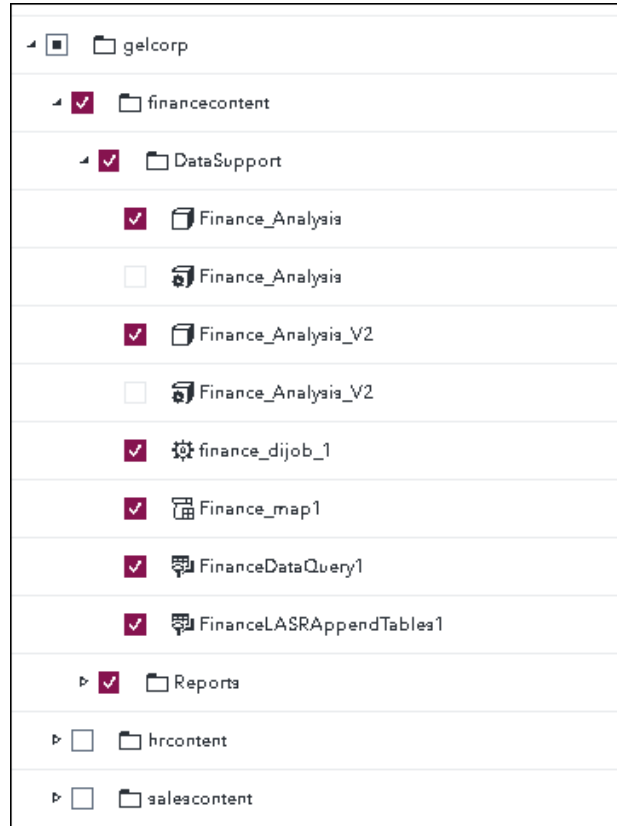
The screenshot shows the 'Import' menu in the top navigation bar. The 'Import' menu is open, showing options: Source, Mapping, Preview, and Results. The 'Mapping Sets' tab is selected, displaying a list of source packages with checkboxes. The 'Import' button is visible in the top right corner. A callout box labeled 'Import Interface' points to the 'Import' menu. Another callout box labeled 'Import tab for import.' points to the 'Import' tab. A third callout box labeled 'Mapping Set tab to manage mappings' points to the 'Mapping Sets' tab. A fourth callout box points to the list of source packages.

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

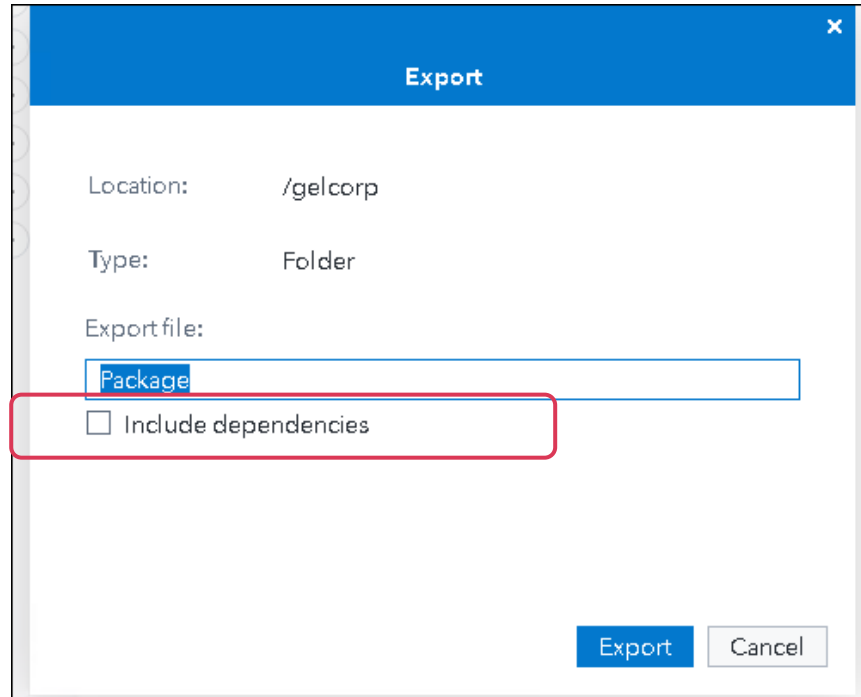
2

2

# Selective Import of Content



# 2021.2.1 Include Dependencies



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



# Relocate Content During Import

- 9.4 SPK only

The screenshot displays the 'Import' interface in SAS Environment Manager. The top right corner shows 'SAS® Environment Manager - Manage Environment' and 'Import'. Below this, there are tabs for 'Import' and 'Mapping Sets'. On the left, a sidebar contains 'Source', 'Mapping', 'Preview', and 'Results'. The 'Mapping' section is active, with sub-tabs for 'Content', 'Users and Groups', 'Tables', 'Properties', and 'Other'. The 'Content' tab is selected, and the 'Target location:' field is set to '/ConvertedEGPProjects'. Below this, the text 'ConvertedEGPProjects' is displayed, followed by 'No items are available.' A white arrow points from a light blue callout box containing the text 'Specify target location.' to the 'Target location:' field.

# 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 'Mapping Sets' configuration page. On the left is a sidebar with 'Mapping' selected. The main area has tabs for 'Content', 'Users and Groups', 'Tables', 'Data Resources', and 'Other', with 'Tables' currently active. A 'Mapping set' dropdown is set to 'System default'. Below this is a table with columns: Source, Target Server, Target Caslib, Target Table, and Exists. The table contains three rows: a root folder, and two sub-folders. The first row has a green checkmark in the 'Exists' column. The other two rows have red 'X' marks. A 'Save' button is visible in the top right of the main area.

**Categories of Mapping**

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

Mapping sets can be edited interactively

Source	Target Server	Target Caslib	Target Table	Exists
└─	cas-shared-default			✓
└─ /gelcorp/financecontent/Data/Lasr...		Select a target caslib		✗
└─ /gelcorp/financecontent/Data/Sou...		Select a target caslib		✗

Import Mapping Sets

Create a mapping set by editing or uploading an existing mapping set or merging two mapping sets into one.

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

# 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

# Mapping Files

## Viya 3.x

A mapping file is a json or yaml file containing mapping information. In Viya 3.x mapping files were used by SAS Environment Manager and the transfer cli.

- **connector**: maps source resources to target resources
- **substitutions**: substitutes values for attributes that are different in the target
- **options** control how the import behaves

```
1  "version": 1,  
   "connectors": {  
     "Table": {  
       {  
         "source": "default",  
         "target": ""  
       },  
       {  
         "resourceName": "LOSS_MAKERS",  
         "source": "/gelcorp/financecontent/Data/Lasr Tables/LOSS_MAKERS(Table)",  
         "target": "LOSS_MAKERS,Financial Data,cas-shared-default",  
         "internalUseOnly": "f6acb496-b929-434e-856c-2f246a7a1300"  
       }  
     }  
   }  
   "UserGroup": {  
     {  
       "resourceName": "*[@Name='Visual Data Builder Administrators']",  
       "source": "Visual Data Builder Administrators",  
       "target": "Visual Data Builder Administrators"  
     }  
   }  
   "User": {  
     {  
       "resourceName": "*[@Name='Fay']",  
       "source": "Fay",  
       "target": "Fay"  
     }  
   }  
   "substitutions": {  
     {  
       "resourceId": "/casManagement/promotion/ASFPVNC.B500000N",  
       "resourceName": "Financial Data",  
       "properties": {  
         {  
           "name": "DirPath",  
           "value": "/gelcontent/gelcorp/finance/data"  
         },  
         {  
           "name": "CASServer",  
           "value": "cas-shared-default"  
         }  
       }  
     }  
   }  
 }
```

# Mapping Files and Mapping Sets

Viya 4

Transfer CLI

can use mapping files but **NOT** mapping sets

SAS Environment Manager Mapping Interface

can create a mapping set from an uploaded mapping file

cannot currently create a mapping file by downloading a mapping set

**WORKAROUND:** use [pyviyatools](#) gettransfermapping.py to create JSON mapping file from a mapping set.

# Content Migration

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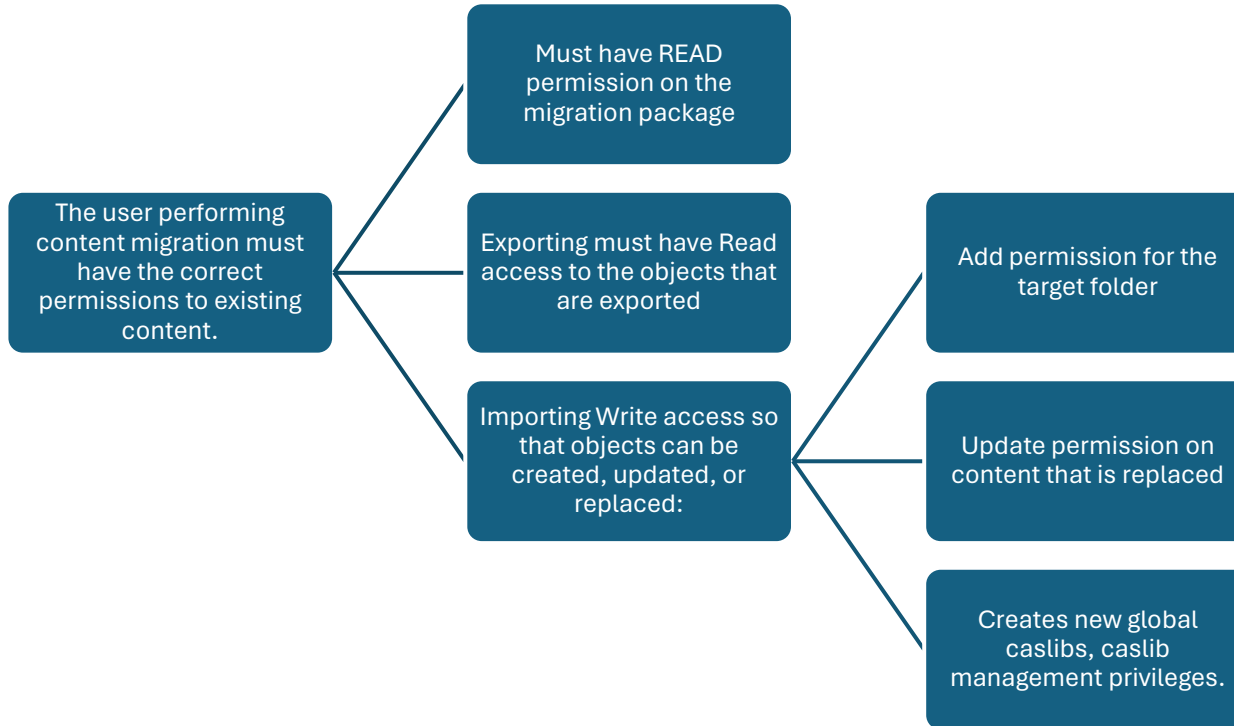
Who Can Do it?

Starting with 2021.1.1 [Stable](#) you no longer need to be administrator to import and export content.

- Import/Export functionality is available to authenticated users by default
- Rules that govern access to import/export may be updated to restrict the functionality to a user or group of users.

# Content Migration

## Permissions





## What Resources Can Be Migrated and What Resources Cannot?





# Current Support: Platform

SAS Version 9 Object	SAS Viya Object(s)
Folders	Folders
Identity Groups	Custom Groups
Direct Access Control Entries	CAS Access Control Entries General Authorization Rules
SAS Libraries	CAS Library Compute Library
LASR Analytic Server	LASR CAS Library



# Current Support

- Visual Analytics

SAS Version 9 Object	SAS Viya Object(s)
VA Report	Report
VA Exploration	Report
VDB Query: SQL	SAS Studio Query
VDB Query: Star Schema	Data Plan
VDB Query: Append	Data Plan
Graph Template	Graph Template
Image	Image
VDB Query: Save to HDFS	Not Supported

# Current Support

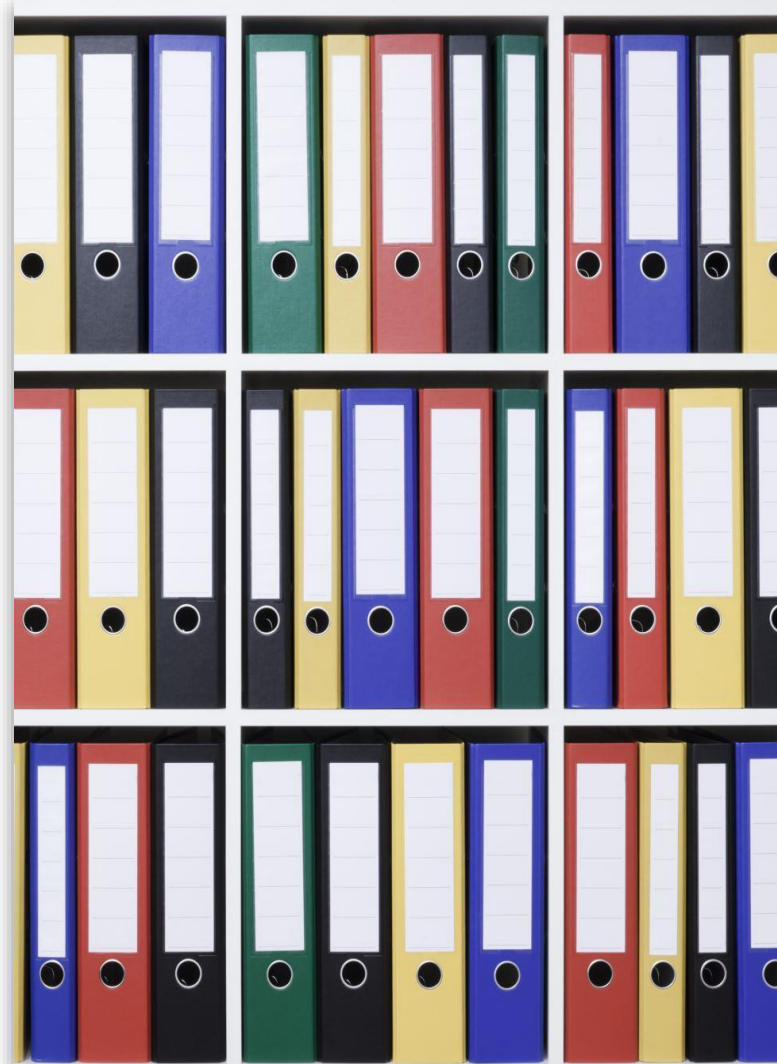
- Analytic, EBI and EDI



SAS V9 Object	SAS Viya Object(s)
Stored Processes	Job Definition
Stored Process Prompts	Task Prompts
Cube: Star Schema	Job Definition, Job Request and Report Data View
Cube: Detailed	CAS Table and Report Data View
Information Map: Relational	Job Definition and Job Request
Enterprise Guide Projects	SAS Studio Flow
DI Studio Jobs	SAS Studio Flow
Deployed Flows	SAS Viya Flows
SAS 9 Forecast Server Projects	SAS Visual Forecasting Projects
Enterprise Miner Projects	No Automated Support
Information Map: OLAP	No Automated Support
Web Report Studio Report	No Automated Support
BI Dashboard	No Automated Support
SAS Information Delivery Portal	No Automated Support

# Data

- Physical **data is not migrated** by the tools
- LASR libraries and servers can be migrated to LASR based CASLIB's
- Base SAS Libraries
  - ---> path-based CASLIB's
  - ---> path-based libraries in the Viya Compute Server
- Database Libraries
  - ---> database CASLIB's
  - ---> compute libraries connecting to database (support being gradually added)
- Table metadata is exported to support migration of authorization.



# EBI/EDI/Analytic Content

## References to Data in SAS Libraries

When migrated content like Stored Processes, DI Jobs or EG Project reference data.

- The library and tables must be made accessible to the Viya compute server
- Any hard-coded libnames in code may need to be edited to point to the location of the data.

# SAS Libraries

- **Viya supports Compute libraries:**
  - 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.

# SAS Libraries

import creates both a CAS Library and a Compute Libraries

Import to CAS and Compute

The screenshot shows the 'Import' interface with the 'Mapping Sets' tab selected. The 'Mapping' section is active, showing a table with columns for 'Resources and Properties', 'Old Value', and 'New Value'. The 'Data Resources' tab is selected, and the 'COMPUTE' resource is highlighted. The 'DirPath' for 'COMPUTE' is mapped to a directory path in Viya.

Resources and Properties	Old Value	New Value
Resources and Properties		
Sales Data		
CAS		
CASServer		cas-shared-default
COMPUTE		SAS Studio compute context, SAS Job Execution compute cont...
ComputeContexts		/gelcontent/gelcorp/sales/data
DirPath	D:\workshop\gelcorp\sales\data	/gelcontent/gelcorp/sales/data

Select Compute Contexts where Library will be created

Remap to directory path in Viya

# Enterprise BI Content

## Migration

In general, for objects that require:

- **Joins and filtering** a SAS Viya Job Definitions and possibly a Job Request is created e.g., Information Maps
- **Calculations, hierarchies and aggregations** a SAS Visual Analytics Data Views is created e.g., Cubes
- **Process Flows** a SAS Studio Flow is created for example Enterprise Guide Projects and DI Studio Jobs

NOTE: A combination of multiple objects can be created.



# Prompts

- In SAS 9.4 prompts could be used in multiple content types, for example, Stored Processes, DI Studio Jobs and Enterprise Guide Projects.
- In SAS Viya there are two types of prompt:
  - Task Prompts (XML) used by Jobs
  - Custom Steps (JSON) used by Studio Flows.

Specify Values for Region and Store Type Sales (Prompt)

Show only required items (denoted by \*)

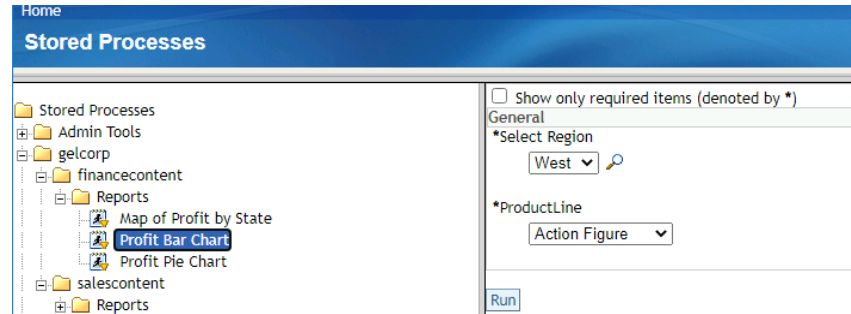
General

\* Holiday ?

(missing values)  
TRUE  
FALSE

# Prompt Migration

- The Current status is:
- SAS 9 Stored processes prompts migrate to task prompts (XML) in Job Definitions in SAS Studio
- SAS DI Studio Jobs and SAS Enterprise Guide project prompts are currently **NOT** supported, but the plan is to migrate them to Custom Steps in SAS Studio flows.



# Stored Process to Jobs

## Prompts

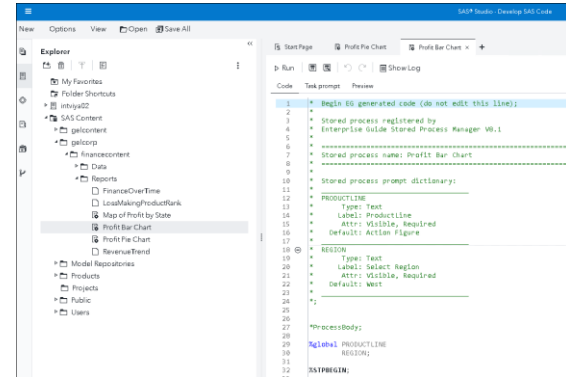
- V9 Shared Prompts referenced by stored processes are converted to non-shared task prompts.
- The data reference for dynamic prompts is converted to use a `library.table`. The data for the prompt must be made available in the compute server.

This functionality requires that shared prompts and libnames and tables for dynamic prompts are included in the package with the stored processes.

# Stored Processes

Stored Processes are converted to Job Definitions which can be run in SAS Studio or directly via a URL. The job definition includes the:

- Job metadata
- SAS Code
- Task Prompts



The screenshot shows the SAS Studio interface with the Job Definition code for a Stored Process. The code is as follows:

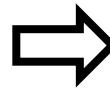
```
1 * Begin SAS generated code (do not edit this line);
2 *
3 * Stored process registered by
4 * Enterprise Guide Stored Process Manager V6.1
5 *
6 *
7 * Stored process name: Profit Bar Chart
8 *
9 *
10 * Stored process prompt dictionary:
11 *
12 * PRODUCTLINE
13 *   Type: Text
14 *   LABEL: Productline
15 *   Attr: Visible, Required
16 *   Default: Action Figure
17 *
18 *
19 * REGION
20 *   Type: Text
21 *   LABEL: Select region
22 *   Attr: Visible, Required
23 *   Default: west
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100 *
```

NOTE: SAS code is copied without modification to the Job Definition

# VA Reports that include Stored Processes

Migration of reports that contains stored processes is supported.

- the VA report is migrated to Viya
- the stored process is migrated to a Viya Job
- the Viya report references the new Job



# OLAP Cubes

OLAP cubes support Includes:

- Hierarchies
- Levels
- Measures (label, format and aggregation)
- Expression
  - Mathematical
  - MDX (Sum,IIF,Round,CoalesceEmpty,LastPeriods)



**NOTE: Data to support cubes must be migrated separately.**

# Detailed OLAP Cubes

Converted to a Data View

## OLAP Cube Studio: Detail Cube

Name	
Hierarchy name	Geo_DIM_2_
Default hierarchy?	No
Caption	Geo_DIM_2_
Description	
Levels	[Facility]Rego
All member	All Geo_DIM1
Translated caption identifier (ML...)	
All member caption identifier (ML...)	

## Viya Visual Analytics: Data

Report 1

Editing

Data

FINANCIALS

Filter

+ New data item

> Category

- Hierarchy
  - Geo\_DIM\_2\_reg\_state
  - Geo\_DIM\_2\_reg\_state\_City
  - Product\_dim
  - Time\_Dim
  - Time\_Dim\_2\_year\_month

# Star Schema OLAP Cubes

Converted to Job Definition and Data View

The image shows two windows from SAS. The left window is 'SAS OLAP Cube Studio' showing a tree view of folders and a 'Quick Edit' dialog box. The dialog box has a table with columns 'Cube Component', 'Caption', and 'Description'. The right window is 'SAS Studio' showing a code editor with a SAS query.

Cube Component	Caption	Description
Sales Order Cube	Sales Order Cube	Sales Order Cube
Dimensions		
Customer	Customer Demographic...	Customer Demographic Dimension
Hierarchies		
AgeGroup_Type_Gender	AgeGroup, Type, Gen...	AgeGroup, Type, Gender Hierarchy
Type_AgeGroup_Gender	Type, Age Group, Gen...	Type, Age Group, Gender Hierarchy
Levels		
Customer_Age_Group	Customer Age Group	
Customer_Gender	Customer Gender	
Customer_Type	Customer Type Name	
Employee	Employee Dimension	Employee Dimension
Hierarchies		
Employee	Employee Hierarchy	Employee Hierarchy
Levels		
Company	Company	
Department	Department	
Org_Group	Group	
Product	Product Dimension	Product Dimension
Hierarchies		
Product	Product Hierarchy	Product Hierarchy
Levels		

```

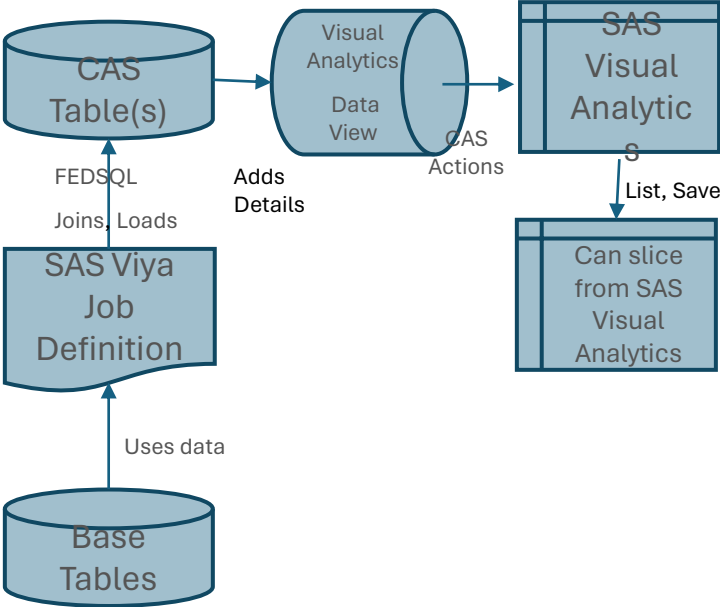
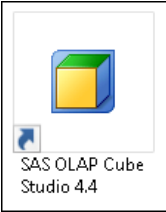
25     print "UserErrorCode: 100";
26     exit 1;
27
28
29     print "Input table: Sales Reporting Library.PRODUCT_DIM found";
30     exists4=doesTableExist("Sales Reporting Library"."CUSTOMER_DIM"
31     if exists4 = 0 then do;
32         print "UserErrorCode: 100";
33         exit 1;
34     end;
35
36     print "Input table: Sales Reporting Library.CUSTOMER_DIM found";
37     /*FEDSQL Code that creates a table containing the same data as t
38     queryCode = 'create table "Sales Reporting Library"."9c220692-b85
39     SELECT
40         t1."CostPrice_Per_Unit" as "CostPrice_Per_Unit",      t1."Q
41
42     FROM
43         "Sales Reporting Library"."ORDER_FACT" t1
44     INNER JOIN      "Sales Reporting Library"."PRODUCT_DIM" t4
45     ON t1.Product_ID = t4.Product_ID
46     INNER JOIN      "Sales Reporting Library"."CUSTOMER_DIM" t5
47     ON t1.Customer_ID = t5.Customer_ID
48     INNER JOIN      "Sales Reporting Library"."ORGANIZATION_DIM" t2
49     ON t1.Employee_ID = t2.Employee_ID
50     INNER JOIN      "Sales Reporting Library"."TIME_DIM" t3
51     ON t1.Order_Date = t3.Date_ID
52
53 ';
54
55 fedsql.ExecDirect result=r status=r.c / query=queryCode;

```

Sales Order Cube		Cube	/gelcorp/s...	2021-01-06 23:44:27.027	INFO	CASL code to create a table for "Sales Order Cube" has been generated.
				2021-01-06 23:44:27.027	INFO	The job request has been saved as Sales Order Cube2021_1_6_23_44_27. You will need to submit this job to create the converted cube output table.
				2021-01-06 23:44:29.029	INFO	The data view "Sales Order Cube" has been generated and associated with table, Sales_Order_Cube.



# OLAP Star Schema to SAS Viya



# Information Maps Relational

Converted to a Job Definition and Job Request

Information Map Studio

Viya SAS Studio

The image displays two side-by-side screenshots from SAS software. The left screenshot shows the 'Information Map Studio' interface. On the left, a 'Folders' pane shows a tree structure with 'Finance\_map1' selected. The 'Selected Resources' pane shows a list of resources including 'Product', 'Product Brand', 'Product Description', 'Facility Type', 'Facility State', 'Facility Region', 'Facility City', 'Facility Age', 'Facility', 'Unit Reliability', 'Unit Id', 'Unit Lifespan', 'Unit Yield (actual)', 'Unit Yield (rate)', 'Unit Yield (target)', 'Profit', 'Expenses', 'PercentProfit', and 'AverageRevenue'. The 'Information Map Contents' pane shows a list of items including 'Finance\_map1', 'Product', 'Product Brand', 'Product Description', 'Facility Type', 'Facility State', 'Facility Region', 'Facility City', 'Facility Age', 'Facility', 'Unit Reliability', 'Unit Id', 'Unit Lifespan', 'Unit Yield (actual)', 'Unit Yield (rate)', 'Unit Yield (target)', 'Profit', 'Expenses', 'PercentProfit', and 'AverageRevenue'.

The right screenshot shows the 'Viya SAS Studio' interface. The 'Code' pane displays the following SAS code:

```
1 /*Proc SQL Code that creates a table containing the same data as the Information Map */
2 option casopt=SO79 casout="controller.sas-cas-server-default-viaypromv.ecv.cluster-1
3 options VALIDVARNAME=NO VALIDROWNAME=EXTEND;
4 cas casout sessopts=(caslib=public);
5 libname public cas;
6
7 PROC SQL;
8 Create table work_fm_00225758 as
9 SELECT
10 Sum(table.ProductID) AS DIR_0 LABEL="Product Id" format=6.,
11 table.Product AS DIR_1 LABEL="Product" format=CHAR15.,
12 table.ProductBrand AS DIR_2 LABEL="Product Brand" format=CHAR7.,
13 table.ProductDescription AS DIR_3 LABEL="Product Description" format=CHAR20.,
14 table.FacilityType AS DIR_4 LABEL="Facility Type" format=CHAR8.,
15 table.FacilityRegion AS DIR_5 LABEL="Facility State" format=CHAR8.,
16 table.FacilityState AS DIR_6 LABEL="Facility Region" format=CHAR8.,
17 table.FacilityCity AS DIR_7 LABEL="Facility City" format=CHAR14.,
18 Sum(table.FacilityAge) AS DIR_8 LABEL="Facility Age" format=2.,
19 table.Facility AS DIR_9 LABEL="Facility" format=CHAR7.,
20 Sum(table.UnitReliability) AS DIR_10 LABEL="Unit Reliability" format=PERCENT6.2
21 Sum(table.UnitId) AS DIR_12 LABEL="Unit Id" format=4.,
22 Sum(table.UnitLifespan) AS DIR_13 LABEL="Unit Lifespan" format=PERCENT6.2,
23 Sum(table.UnitYieldActual) AS DIR_14 LABEL="Unit Yield (actual)" format=4.,
24 Sum(table.UnitYieldRate) AS DIR_15 LABEL="Unit Yield (rate)" format=PERCENT6.2,
25 Sum(table.UnitYieldTarget) AS DIR_16 LABEL="Unit Yield (target)" format=4.,
26 Sum(table.Profit) AS DIR_17 LABEL="Profit" format=DOLLAR15.2,
27 Sum(table.Expenses) AS DIR_18 LABEL="Expenses" format=DOLLAR15.2,
28 (table.Profit / table.Expenses)*100 AS DIR_19 LABEL="PercentProfit" format=0C
29 MEAN(table.Revenue) AS DIR_20 LABEL="AverageRevenue" format=DOLLAR15.2
30
31 FROM
32 "Financial Data"n."FINANCIALS"n table
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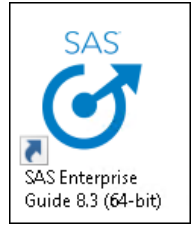
NOTE: Data Studio will be end-of-life by 2024.12. Users are encouraged to use SAS Studio

# Visual Data Builder Query

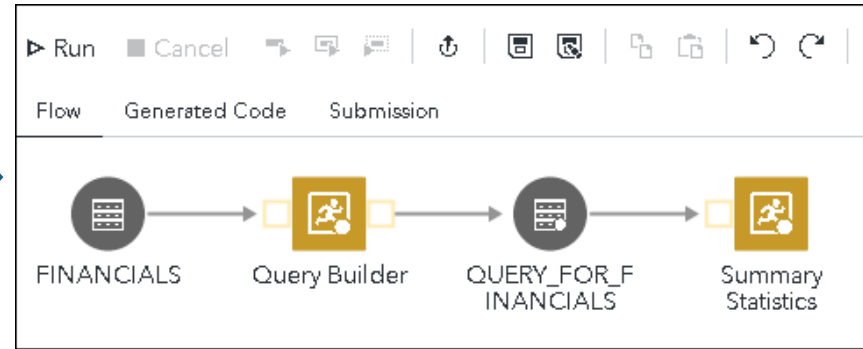
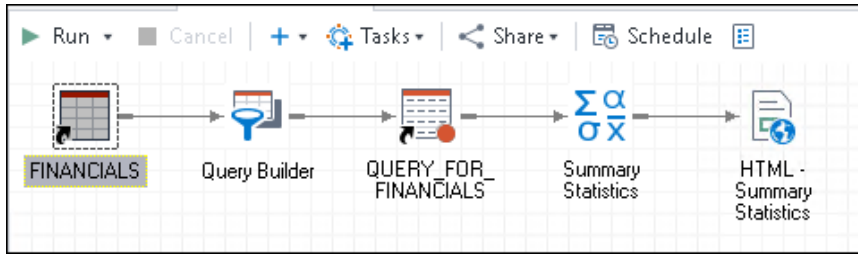
SAS 9.4	Viya
VDB Query: SQL	SAS Studio Query
VDB Query: Star Schema	Data Plan
VDB Query: Append	Data Plan

# Enterprise Guide Project to Studio Flow

What Happens



Each process flow within a project is converted to a SAS Studio Flow



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

# Enterprise Guide Tasks

## What happens

Enterprise Guide tasks may be:

- **Migrated** to the equivalent node in Studio e.g., Query, Data, Append, Filter, Sort etc.
- **Migrated** to SAS Program Nodes in SAS Studio.
- **Not supported** because there is no equivalent in Viya e.g., Update Library Metadata
- **Require manual updates** of the resulting program node

Continuing development is adding support for migration of tasks to nodes with equivalent functionality. For details of which nodes are supported see [Migration Status | SAS 9 to SAS Viya 4 | Sales Central \(highspot.com\)](#)

# Enterprise Guide Projects

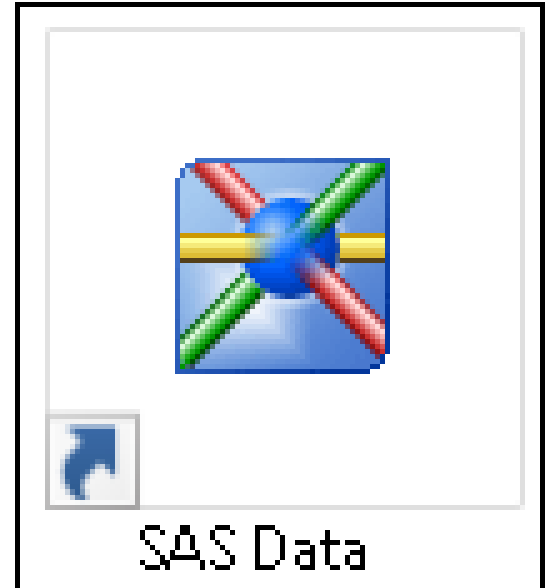
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- Projects from Enterprise Guide 7 and 8 are supported.
- Individual Projects can be imported directly using Environment Manager or the transfer plugin of the sas-viya CLI.
- Multiple projects can be imported in batch with a CLI delivered with Content Assessment
  - Uses Content Assessment csv output and imports all Projects in a csv file
  - OR all Projects in a directory path.



# Data Integration Studio Jobs

- SAS Data Integration Studio jobs are migrated to SAS Studio Flows in SAS Viya
  - DI Studio Transforms become SAS Studio Steps
  - Libname statements are commented out
  - Metadata server code is commented out
  - Manual updates to the code created will most likely be required
  - Always include all dependent metadata objects in the package when you export DI Studio Jobs
  - Continuing development is adding support for migration of transforms to steps with equivalent functionality.



# Enterprise Guide and DI Studio

- Use the Profile Reports to identify the migration status of projects and jobs, and of the objects within each.

Filters: 01\_Split\_Finance\_Data

## Which SAS 9 transforms used in my deployment will migrate to SAS Viya?

See [About This Report](#) for the definition of migration candidate in this report. See [Migration Explained](#) for additional details on migration status.

Ideal Fit (100%)

Select a transform to filter the table: SAS 9 Transform

Select a type of SAS Studio step to filter the table: SAS Studio Step

Select a message to filter the table: Conversion Message

Select jobs (transform count) to filter the table:

- 01\_Split\_Finance\_Data 4
- DIFT Parameterized Job for Company Profit... 15
- DIFT Profit 15
- DIFT Profit Forecast for Australia 15
- DIFT Profit\_V2 13

Transform Name	SAS 9 Transform	SAS Studio Step	Conversion Fit	Conversion Message
Create Table (Facility=South)	Create Table	Query Step	Ideal Fit	The transform migrated to ideal fit.
Extract based on Date	Extract	Query Step	Ideal Fit	The transform migrated to ideal fit.
Create CSV (Facility=West)	File Writer	Export Step	Ideal Fit	The transform migrated to ideal fit.
Split based on Facility Region	Splitter	Branch Rows Step	Ideal Fit	The transform migrated to ideal fit.



# Enterprise Miner Projects

- Content Migration is NOT currently planned for Enterprise Miner Projects. Enterprise Miner customers can transition to SAS Visual Data Mining and Machine Learning (VDMML) on SAS Viya4.
- It is possible to move code from EM projects to the following nodes in VDMML :
  - Score Code Import node
  - Batch Code node
  - SAS Code node



# 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.egg, 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)
------------	---------------------------	---------------------	------------------------

SAS 9 Source Name	OriginalType	SAS Studio Flow Name	Total Number of Steps	Studio Step Type	Steps Not Migrated
Finance_01.egg	Project.EG	Process Flow	15	SAS Enterprise Guide Task	0
Finance_02.egg	Project.EG	Process Flow	10	SAS Enterprise Guide Query	0
Finance_Append_data.egg	Project.EG	Process Flow	5	Registered Table	0
Finance_Combine_and_Characterize.egg	Project.EG	Process Flow	14	ODS Result	3
Finance_Data_Prep.egg	Project.EG	Process Flow 1	5	Data	0
Finance_Data_Prep.egg	Project.EG	Process Flow	6		
Finance_distribution.egg	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.egg	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:44:41.582Z	Finance_01.egg	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:47:25.004Z	Finance_01.egg	Process Flow	FINANCIALS	Registered Table	Needs Attention
2021-06-01T19:38:33.665Z	Finance_01.egg	Process Flow	HTML - Choropleth Map	ODS Result	Step Omitted
2021-06-01T19:44:41.582Z	Finance_01.egg	Process Flow	HTML - Summary Statistics	ODS Result	Step Omitted
2021-06-01T19:47:25.004Z	Finance_01.egg	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.

# What will not Migrate from SAS 9 to SAS Viya

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How to Address with SAS Viya

- SAS 9 Information Delivery Portal
- SAS Web Report Studio Reports
- SAS BI Dashboard
- OLAP Information Maps
- SAS Enterprise Miner Projects

# Summary



**CONTENT MIGRATION IS**  
THE PROCESS OF COPYING  
CONTENT WITHIN OR  
BETWEEN DEPLOYMENTS



IMPORT/EXPORT TOOLS ARE  
USED TO MOVE CONTENT  
FROM SAS 9.4 TO VIYA.



SAS VIYA 4 HAS A NEW AND  
IMPROVED INTERFACE FOR  
IMPORTING CONTENT



VIYA 4 INTRODUCES  
"MAPPING SETS" WHICH ARE  
STORED IN  
THE INFRASTRUCTURE DATA  
SERVER.

# Summary

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SAS 9 CONTENT IS MIGRATED TO  
VIYA OBJECTS ON IMPORT.



DEVELOPMENT WORK TO  
SUPPORT MIGRATION OF SAS 9  
CONTENT TO VIYA 4 IS ONGOING



REVIEW THE MIGRATION STATUS  
DOCUMENT FOR UP-TO-DATE  
STATUS INFORMATION ON  
MIGRATION OF SAS 9.4 CONTENT.