SAP Analytics Cloud
Suggested Lifecycle Management concepts and workflows

Recommendations based on SAP Analytics Cloud Wave 04.2018

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1   INTRODUCTION

This document provides information and suggested workflows for SAP Analytics Cloud BI content lifecycle management (LCM) functionality. It describes the SAP Analytics Cloud Lifecycle Management features, as well as suggested workflows for BI content lifecycle management.

2   SCENARIOS

Here are a few examples of traditional reasons for having multiple environments for on premise software and their applicability for a cloud solution like SAP Analytics Cloud:

Component	On-Premise	SAP Analytics Cloud
Software update	An option to delay production system software updates until all tests confirmed that test system is stable. Production system software quality is customer's responsibility.	Software update of all systems is automatically done on regular basis by SAP. Production system software quality is SAP's responsibility.
Hardware or infrastructure update	An option to delay production system hardware and infrastructure updates until all tests confirmed that test system is stable. Production system hardware and infrastructure quality is customer's responsibility.	Hardware and infrastructure is updated and fully managed by SAP. Production system hardware and infrastructure quality is SAP's responsibility.
Performance	An option to separate production and test system for performance reasons.	The elasticity inherent in cloud SaaS potentially removes the need for this.
Multiple data sources	Requirements to have different data sources, for development and production (data privacy, performance of backend database etc.)	Same as in on premise case.
Content update / promotion	Controlling timing of content updates and promotion. Delaying promotion of content to production system until all tests confirmed that the content work as expected on a test system.	Same as in on premise case.

Use cases for software or hardware updates as well as performance are not applicable to SAP Analytics Cloud, while multiple data sources and content management is applicable for on premise systems as well as for SAP Analytics Cloud.

The system usage can also impact the types and complexity of lifecycle management needed

Business-Led Self-Service BI - Business supports all elements of solution (preparation, modeling, report creation and execution)

IT-Managed Self-Service BI - IT owns data preparation, modeling. Business owns report creation and execution.

Corporate BI - IT owns all aspects of preparation, modeling, report creation. Business just consumes content.

Typically, large deployments contain a mixture of all the above use cases and so different types of content lifecycles will need to be considered for the differing use cases.

3   SAP ANALYTICS CLOUD TEST SYSTEMS

SAP offers development and test systems. These systems can be used for testing purposes only. Production use is strictly prohibited. There is a cost associated with the test systems.
At the time of writing the following options were available:

Test Tenant 64GB/12CPU	Production use strictly prohibited. Minimum contract length of 1 year. Limited to 50 users.
Test Tenant 128GB/24CPU	Production use strictly prohibited. Minimum contract length of 1 year. Limited to 50 users.
Test Tenant 256GB/32CPU	Production use strictly prohibited. Minimum contract length of 1 year. Limited to 50 users.

It is best practice to have a development (test) tenant and a production tenant. With this setup, deployment using export/import is available to minimize manual updates to content and therefore reduce possible issues when promoting material.

Though it is an option to work in a single tenant for development and production purposes, changes to content will mostly be manual as export and import is not currently possible between folders of the same tenant.

4   AUTHORIZATIONS AND ORGANIZING CONTENT

SAP Analytics Cloud uses a file structure to organize and restrict content. There are various mechanisms to restrict content in SAP Analytics Cloud which include Roles, Teams and Sharing Settings.

4.1   Organizing Content

SAP Analytics Cloud's uses a File Hierarchy for organizing content starting with the System Directory which is the root directory.

    a. Public Folder: By default, this folder is accessible to anyone having access to the SAP Analytics Cloud tenant. This should be the main folder where additional subfolders are added to organize content and restrictions. It is recommended that any content folders that will be exported to other tenants (For example, from a Development to Production tenant), should be created under the Public Folder and then restricted using Share Settings with Teams/Users assignment.

    b. Samples Folder: Contains the SAP Business Content Samples that include data, stories and digital boardroom content that can be activated as a starting point for SAP Analytics Cloud Projects. This folder is restricted based on authorizations. For more information on SAP Business Content, go to https://www.sapanalytics.cloud/learning/business-content

    c. Users Folder (My Files): Contains a private folder per user of SAP Analytics Cloud and can only be accessed by the user. "My File" folders will be used as a staging folder for content until content is ready to be saved into public or restricted folders.

    d. Teams Folder: When Teams are created under security, by default a Team Folder will be created. Teams folders are only accessible by members who have been included in the team. Though content can be saved to a Teams Folder, if there is any deployment (import/export) between tenants, currently, content under the Teams Folder can not be selected for export. It is recommended to use restricted subfolders under the Public directory for promotion.

Figure 4.1.1
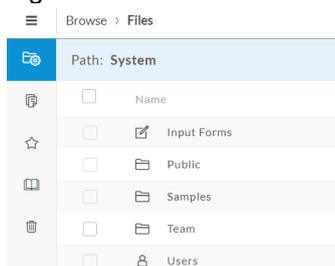
4.2 Users

For more information, refer to the Help Guide in your tenant and under Security search for Creating Users.

Additional information can be found in the following series of blogs:
https://blogs.sap.com/2017/02/01/introduction-to-the-jf-tech-boc-administration-series/

4.3 Teams

To restrict content under folders, it is recommended to set up Teams and include members (users) to be part of the group. Once a team is created, a team folder will appear under the System Root.

Keep in mind that you may have some users in a group that should only display content and others that also create/update content.   In this case, it is possible to create different teams based on what they should have access to so that you can limit restrictions in the Share settings.

Figure 4.3.1
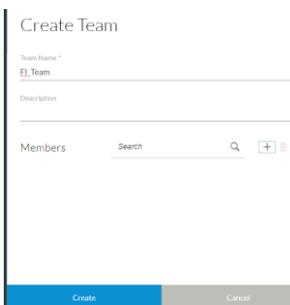
For more information, refer to the Help Guide in your tenant and search under Security for Creating Teams.

4.4 Share Settings

There are various objects that can be shared in SAP Analytics Cloud, for example, story templates and stories.

The content creator develops a template or story in its own private folder.

The content creator can then either:

- Make the template or story public by saving it into Public folder or make the template or story accessible to the teams by sharing to a specific folder for that team.

Figure 4.4.1

- Shares with specific users or teams. In this case a copy of the story will be save into Shared folder

Figure 4.4.2
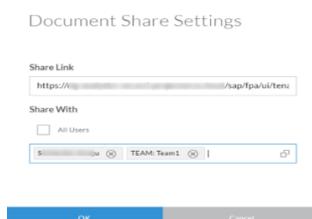
When sharing a story, ensure the correct rights are set.

Figure 4.4.3
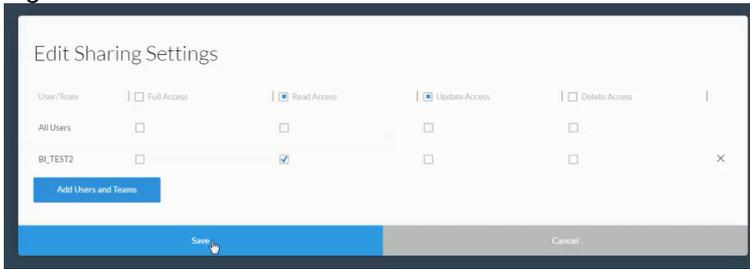
In case of a shared story, the users will receive an email. They will be able to access the story by clicking to "Open Story".

Figure 4.4.4
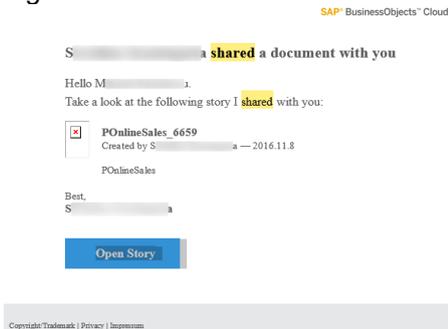
The content creator can update a shared story or template. The users will see the new version of the content once they re-open it. The content creator can advise the users about the new version by using the Collaboration feature of SAP Analytics Cloud.

For information on how to Share objects with Teams and Users refer to the official help in your SAP Analytics tenant.

4.5   Roles

It is best practices to create custom roles in your tenant to assign to your users as the Standard Delivered Roles have broad scope. You can use the Standard Delivered SAP Analytics Roles as a template and customize as required.

For Import Data Models, you can also restrict access based on specific dimension data in a model if you set a model's privacy toggle to on under Preferences option in the model.

Figure 4.5.1
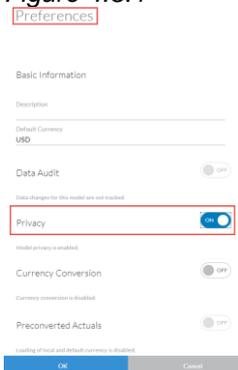
For more information on Role Creation, Standard Delivered Roles and Privacy settings on models, refer to refer to the Help Guide in your SAP Analytics Cloud tenant.

5   CONTENT TYPES

Within SAP Analytics Cloud, various types of content can be created through a variety of mechanisms. SAP Analytics Cloud also has information and dependencies associated with content.
For the purposes of this document we will be primarily considering content created for BI use cases. This includes connections (to data sources), models, stories, story templates, Digital Boardroom agendas and any associated dependencies of the BI content types.

Note that the principles outlined in this document will apply to any of content types created within a SAP Analytics cloud deployment.

5.1   Connections

Connections are objects used to provide details on system access to either Live data sources (HANA, BW, Universes, etc.) or Import Data sources (ERP, OData, SQL etc.).

At the time of this document creation, connections can't be included in a folder so can only be limited on an individual basis using Share settings though there is a general model access option to select in roles.

5.1.1   Live Connections

- By default, can be accessed by anyone having access to an SAP Analytics Cloud Tenant.
- Security: It is best practices to set up Single Sign on (SSO) for these connections instead of User and Password only. By using SSO, any data within stories using the live connection and model will be limited to the authorizations in the data source that the SAC user has access to. This is the most secure way of ensuring data is only viewed by those authorized.

5.1.2   Import Data Connections

- By default, these connections are only editable by the creator.
- Security: On an individual basis, can be shared (read only) with teams and users so that they can be used in model creation by other users/teams.
- Import Data Connections do not support SSO so the data imported in a model is based on the user credentials stored in the connection.   Access to specific data connections aren't available in Role Management (there is only an overall option in Roles) therefore individual access is based on share settings.

5.2   Models

Models are representations of data which includes metadata about a data source and in the case of import data models, will also contain master and fact table data.
- There are 2 types of models, an Analytic Model and a Planning model.
- An Analytic Model can be against Live connections (HANA, BW, Universes) or Import Data Connections (ERP, OData, SQL, etc.)
- Currently, Planning models can only be against Import Data Connections.
- Models against Live Data Connections
    - Do not store dimension and fact table data, as data is only displayed at the time of viewing a story. It is highly recommended to use Single Sign On in the connections for Live data to maintain the integrity of the security settings at the data source level. Data Level security within Roles will therefore not be required in SAC.
- Models against Import Data Connections
    - Replicate data from the data source into SAP Analytics Cloud. Master data can be seen in dimensions and transactional data is stored in the fact table of SAC.
    - Model access can be restricted based on Roles. Since data will be replicated based on the credentials entered in the connection, anyone having access to the model will have access to the data.
    - Import Data models can also be enhanced to include formulas, custom hierarchies, location information etc.
    - To create restrictions at a dimension member level:
        - You can enable data access control in a newly created or existing dimension within the model and then use the read/write columns for specific dimension members to

limit access to specific members or teams. These permissions will also be reflected in what dimensions a user or team can see in a story which uses the dimension. For more information, refer to the Help Guide in your tenant and under Models and search for dimension data access.

- As an alternative, roles can also be used. The privacy setting of a model can be set to on, then within a Role, additional security granularity can be set. For instance, if a team should only be able to access a specific company code, then this can be set in the required role.
- **Note:** SAP Analytics Cloud does not have the option to automatically synchronize authorizations from a data source (e.g. SQL, ERP) to SAP Analytics Cloud Roles.

5.3 Stories, Story Templates and Digital Boardroom Agendas

5.3.1 Stories

Stories are at the center of the SAP Analytics Cloud experience. They let you explore data interactively to find insights, visualize information with charts and tables, and share, present, and comment on your findings with colleagues.

5.3.2 Story Templates

SAP Analytics Cloud has the concept of a story 'template'. A story can be saved as a template that can be used to re-create content based on design best practices, corporate standards or simply to speed story development in agile use cases.

To optimize both trusted content as well as agility within a deployment, we would recommend developing a set of SAP Analytics Cloud templates as well as stories. Users can access the templates in SAP Analytics Cloud and use those templates as a starting point for their own exploration and analysis. Users can start their analysis from an existing layout or design, rather than starting from scratch with a 'blank canvas'.

When a template is used (opened) a new story based on the template design is created. This new story can then be populated, saved and managed in the same way as any other story by the user. It is even possible to re-save the created story as a new template design.

5.3.3 Digital Boardroom Agendas

Digital Boardroom Agendas are places to design real-time, interactive boardroom presentations. The Digital Boardroom agenda leverages existing stories. To see the complete digital boardroom presentation, a content creator/consumer would also need to have access to the underlying stories in the Digital Boardroom agenda.

5.3.4 Saving Stories, Story Templates and Digital Boardroom Agendas

Stories, Story Templates and Digital Boardroom Agendas can be saved in:
  i) My Files folders (Private folder) so that only the creator can see the story
  ii) Directly into the main Public Folder if a user wants to give access to everyone in the SAC tenant.
  iii) Within restricted folders that have Share Settings with specific teams only. (Shared or Team Folders)

The recommendation is to save the stories, story templates and Digital Boardroom agendas starting with My Files and when the content owner is comfortable with sharing, then they can use the Save As option, for example, to save to other public or restricted folders as required.

Important Note: In a multitenant environment, it is highly recommended to segregate stories using restricted folders under the Public Folder tenant. Stories and their dependencies (including folders) can then be exported to the production tenant. Only Files that are contained in Public or Public subdirectories can be exported. If you create a folder anywhere else, you will not see the option to export these folders.

6   CONTENT LIFECYCLE MANAGEMENT AND PROMOTION OVERVIEW

In this section, we will review the suggested best practices for content management and promotion in environments with the recommended multiple SAP Analytics Cloud systems (tenants) as well as a single SAP Analytics Cloud system ("tenant")

It is highly recommended to use a development (test) tenant and a production tenant for optimal Lifecycle Management.

Typically for a single tenant landscape Analytics Cloud folder structures and rights will be used to control access to content however **since deployment (import/export) can't be done between files, much of the updates to content will need to be manual**. **SAP Analytics Cloud stories do not currently support repointing of content to different models**. For multiple tenant landscapes the folder structures and rights as well as the capability to import and export content will be used.

Promotion of content (for example from a Development Tenant to a Production Tenant) can be achieved in SAP Analytics Cloud using the capability to export content from one tenant and to import it on a different tenant. In most cases customers would export and import the connection only once (or not at all if it has already been created on the target production system), but the model/stories would be promoted as often as new stories or models are developed or modified. To move SAP Analytics Cloud content from Development to Production the user/administrator would export a story from the Development system (under Deployment -> Export), this will generate a compressed file of the content selected. That file can then be manually imported to the Production system (under Deployment -> Import).

For full details of the import/export capabilities see Chapter 11 'Deployment' of the SAP Analytics Cloud user guide.

6.1   Multiple tenants

As mentioned previously, this is the recommended approach to Lifecycle Management processes. Some customers may want to have one tenant per data source environment. For example, if a customer has a development, test and production BPC system, then they may decide to have a development, a test and a production tenant in SAP Analytics Cloud. Another customer may decide one development (test) tenant and one production tenant will suffice.

For full details of the import/export capabilities see Chapter 11 'Deployment' of the SAP Analytics Cloud user guide or use the following Deployment.

6.1.1   Security

In general, Users and permissions need to be set up on each tenant. Some objects can be exported and imported such as Roles and Folders. When you export a story, it will automatically bring over the Folder as well. Users and Teams will need to be created and share settings and permissions will need to be re-applied in production.

If SSO is being used, it must be set up on each tenant.

Connections will only need to be exported and imported once and connection details can be changed in the target tenant. Another option is to manually create a connection in production. Either way is acceptable but if a model uses a specific connection, then the connection names must be the same in Test and Production.

SAP Analytics Cloud security content, for example Roles, that gets changed in a test tenant can be redeployed to the Production tenant using the update (overwrite option).

6.1.2   Example workflow

In environments with multiple SAP Analytics Cloud tenants, an example of tenant tasks and deployment are as follows for a BI only scenario: (this is just a guideline but may be adjusted based on customer requirements).

Test Tenant

Step	Task
1	*Create Custom **Roles** using the **Standard Delivered Roles** as templates and customize as required.
2	Create **Users** and assign **Roles**
3	*Create **Teams** based on how content will be restricted and include members. (**Teams** can't be exported so will be created manually in Production tenant)
4	*Create **Folders** under the **Public Directory** based on how content will be restricted and use Share Settings to restrict by teams and set permissions.
5	*Create **Connections**. For **Import data connections**, share connections as required.
6	*Create **Models** and limit access in **Roles** if required. For **import data models** requiring dimension level authorizations, set the **Privacy Flag** in the model properties and include restrictions in corresponding **Roles**. This is not required for **Live as Single Sign On** is recommended. **Live data models** also have re-point options to different connections.
7	*Content Creators create **Stories, Story Templates and Digital Boardroom Agendas** and save them **privately** and then save them to appropriate folders to **share** when ready.
8	**Export Roles** to Production Tenant. Note: Roles can also be created in the Production Tenant.
9	***Export Connections** to Production Tenant. Note: Connections can also be created in the Production Tenant. For connections, the **same names** must be used in Test and Production but connection details can be different in production
10	**For **initial export** of content to Production, select highest level e.g. Story or Digital Boardroom to export and include all dependencies without data. For **Imported Data models**, for manually created objects like formulas, hierarchies etc., a dimension/account will need to be set to be transported with data otherwise enhancements have to be done manually in production.
11	**To **export** a change to content that has already been imported to production, select the object and unselect any dependencies that you do not want to include.

*Names should remain the same between a Test and Production landscape for some objects. For example, rather than calling a Model SalesVolumes_Test, it may be better to call it SalesVolumes.
** There is a limit of how large an export file can be so it is not recommended to include transactional data with the export but to reload in Production based on the connection.

Production Tenant

| Step	Task
1	Import Custom **Roles** from Test or Create Custom **Roles** directly in production using the **Standard Delivered Roles** as templates and customize as required.
2	Create **Users** / Assign **Roles**.
3	Create **Teams** based on how content will be restricted. (**Teams** can't be imported so will be created manually in Production tenant)
4	Import **Connections** from Test or Create Connections in the production tenant. If you imported the connection, change the system connections as required. For **Import Data connections**, also share the connections as required.
5	Initial deployment: Use **Deployment ->Import** to bring in content from Test. For the Initial Load, do not select Update or Drop Object flags as this is the first time you are importing. If you included data in your model, then choose include data where required.
6	Assign **Teams** to the imported folders using share settings where applicable.
7	Set permissions on **Connections, Models** and Model data as required.
8	Change **Connection** details if it has been imported. For Live data, in the model there is also an option to repoint to a different connection.
9	For **Import** Data models, **schedule a data refresh** to bring in data from production connection. For live connections, there is also an option to repoint an existing connection to a different connection.
10	For **import** of individual objects that already exist in the tenant, best practices is to check the **Update** flag to apply the changes to that object only. Drop objects will drop dependent objects that are not included in the import so use this option with caution.

6.1.3   Content Design

The content creator develops models, stories and templates in a development tenant.

6.1.4   Content Promotion

The content creator or administrator exports the stories and/or data models by using Deployment features. There is an option to export/import just a model and story or to add the connection too. In most cases customers would export and import the connection only once (or not at all if it has already been created on the target production system), but the model/stories would be promoted as often as new stories or models are developed or modified. To move an SAP Analytics Cloud story from Development to Production the user/administrator would export a story from the Development system (under Deployment -> Export), this will generate a compressed file of the content selected. That file can then be manually imported to the Production system (under Deployment -> Import). For full details of the import/export capabilities see Chapter 11 'Deployment' of the SAP Analytics Cloud user guide.
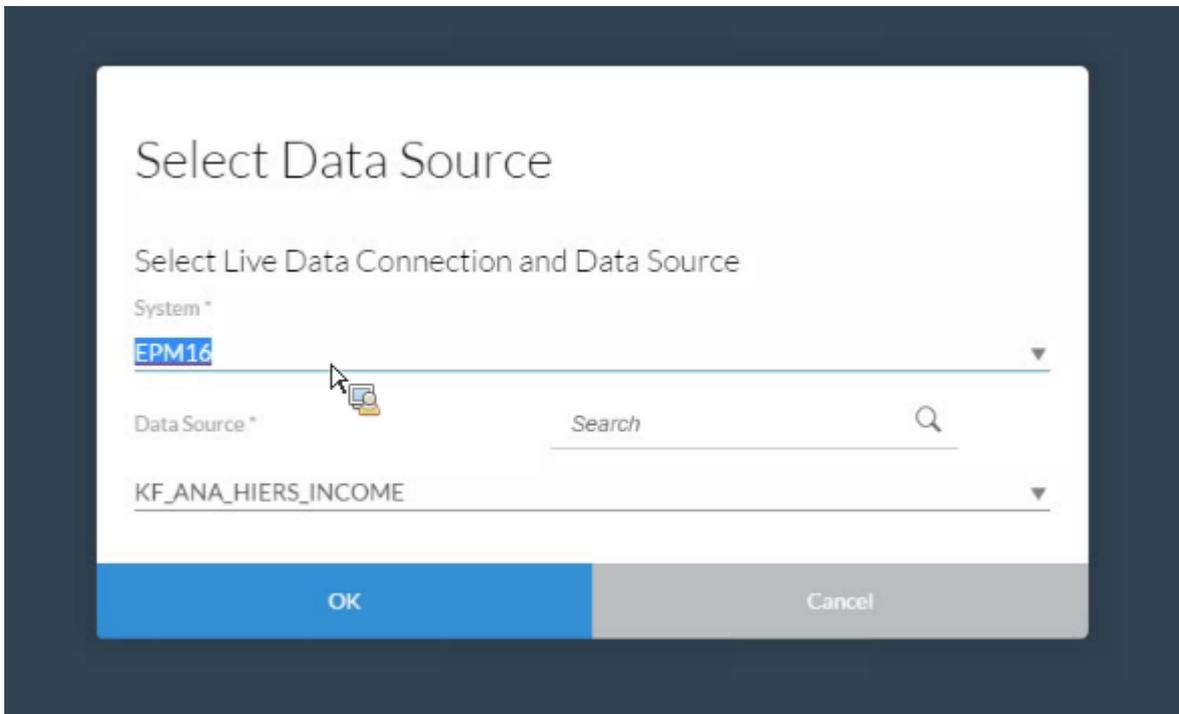
Figure 6.1.4.1
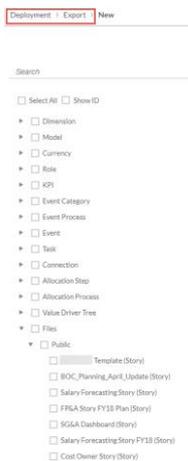
- The content creator or administrator imports the work into the production tenant. The stories are imported into the same folders on target system as they were on the source system.
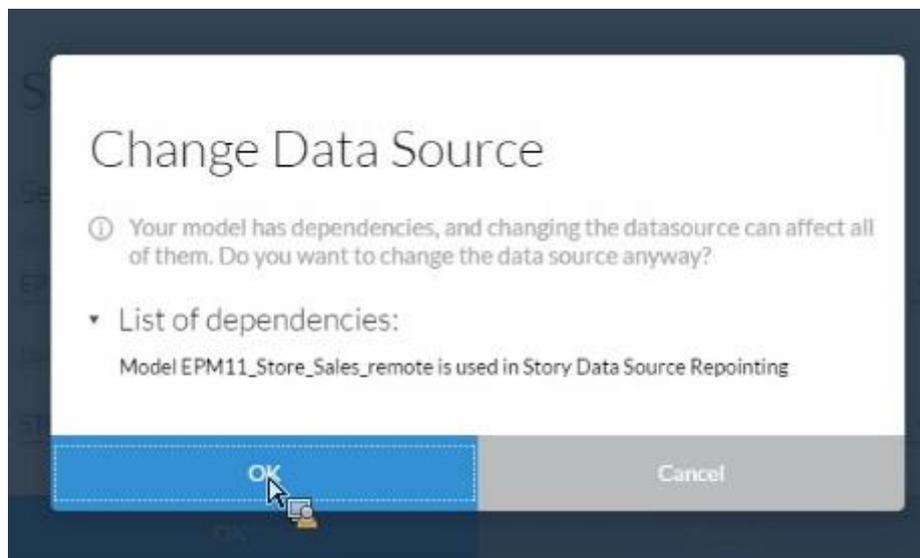
- For models with live (online) sources the connections may be re-pointed after promotion. This will allow a model created against a test data source to be re-pointed to a production data source for example.
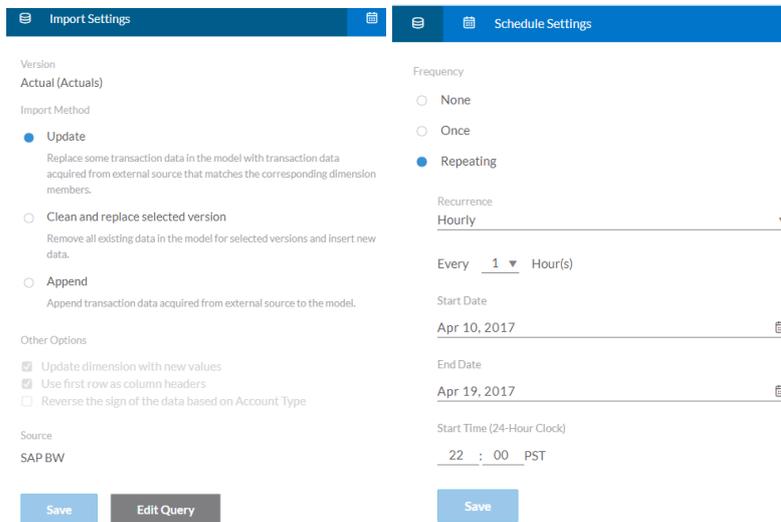
Figure 6.1.4.2

- If there are dependencies, you will be warned.

Figure 6.1.4.3

- For models created with acquired data, the model can be re-scheduled to re-run the data acquisition job in the new system. This will allow for a model created with data from a test data source to be refreshed with data from a production data source for example.

Figure 6.1.4.4

- The content creator can advise the users about the new version by using the Collaboration feature of the SAP Analytics Cloud.

6.1.5   Content Consumption

The users can open content located in Public / Team folders as well as content that has been shared with them. Only users with appropriate rights can modify the content. To modify content, the user has to save the content to their own private folder first. After that the user can share the content with other users.

6.1.6   Notes for multiple tenants

Content must be imported into the system with the same or subsequent version (+1) of SAP Analytics Cloud as the system from which the content was exported. SAP Analytics Cloud is updating to a new version every 2 weeks.

The connection can also be imported and exported. It is possible to import a connection and after that to modify the connection details to point to a different database.

To deal with the same name content in different environments, SAP Analytics Cloud has the concept of namespaces. This should be set up in the System->Administration->Content Namespace (the default value is t.x). It is recommended to setup a specific namespace, such as company.test.xxx. Hence, when exporting and importing content, objects with the same names from different sources can co-exist in the system.

Any third-party software for versioning of Analytics Cloud export files can be used, however in practice due to the rapid upgrade cycles of Analytics Cloud the older version quickly becomes obsolete. Content version management is a planned future enhancement.

For models with large data volumes, it is not recommended to export transactional (fact table) data to deploy to production as there is a limit on how large an export file can be. Recommendation is to schedule data loads in production directly from the data source.

6.2   Single tenant

6.2.1   Example workflow

In environments with a single SAP Analytics Cloud tenant the recommended guidance is:

- Content creators build a set of SAP Analytics Cloud stories and templates based on existing data models.
- These stories and templates are shared with users or teams through the SAP Analytics Cloud folders: Public, Shared, Teams, and Private.
- Users login in SAP Analytics Cloud and start analysis from an existing template or view a story.
- The cycle repeats with step one. Content creators can further improve the set of SAP Analytics Cloud templates and stories or can use as input stories developed by business users in step three.

6.2.2   Content design and sharing

See section 4.1 Organizing Content .

6.2.3   Content Consumption

The users can open content located in Public / Teams folders as well as content that has been shared with them. Only users with appropriate rights can modify the content. In order to modify content, the user has to save the content to their own private folder first. After that the user can share the content with other users.

6.2.4   Notes for single tenants

Stories will use the same models in a single tenant. Stories cannot be 're-pointed' to another model.

Ensure that the recipient has access rights to underlying data models when sharing stories.

Though there are some processes that can be used to organize and restrict/share content, the recommendation is to use multiple tenant deployment as optimal set up for Life Cycle Management.