HEXAGON

HxGN EAM Integration with AcceleratorKMS

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Contents

This brief provides configuration and implementation information on the integration of HxGN EAM with AcceleratorKMS (AKMS). HxGN Databridge Pro is the middleware solution that is used to support the exchange of data between the two solutions.

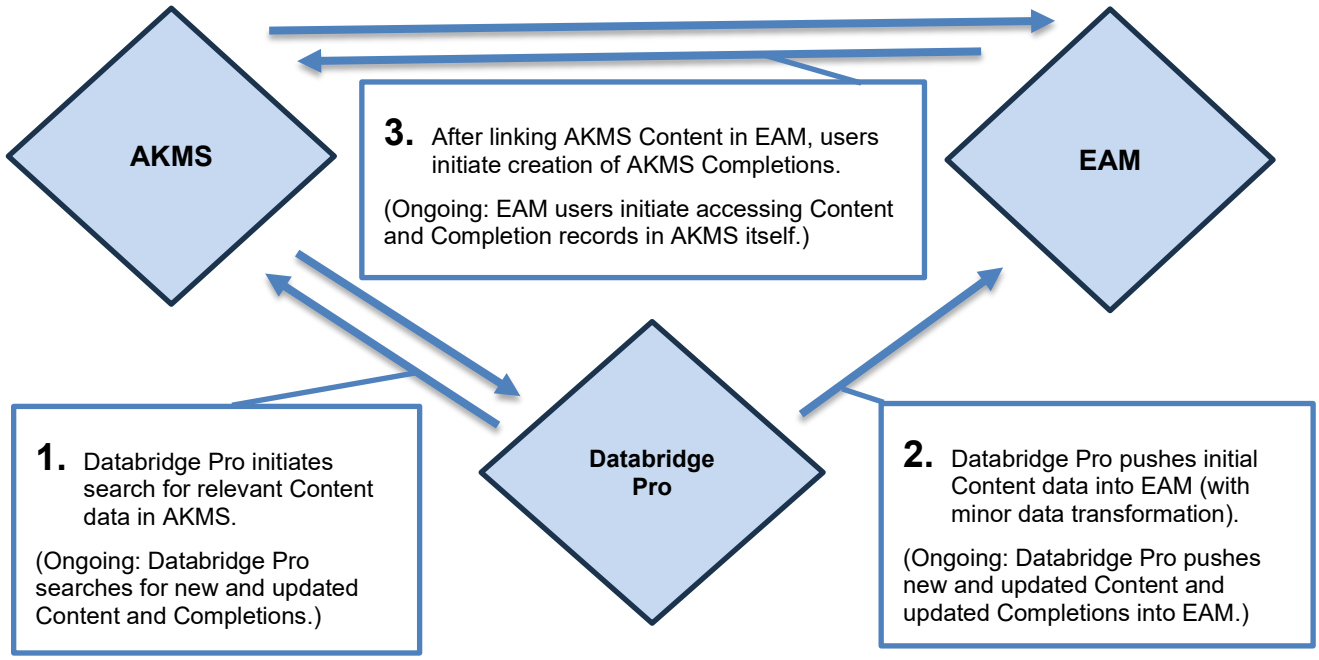
In addition, this brief describes the configuration requirements and the setup instructions within AKMS, EAM and Dataflow Studio (a component of Databridge Pro) to complete the configuration. This brief is intended to supplement the documentation of this feature. It is not comprehensive and may not include all the details about this functionality.

Intended audience

This brief is intended primarily for system administrators, implementation consultants, and product architects.

Overview

HxGN EAM has incorporated features within the product to facilitate the integration with the AcceleratorKMS (AKMS) application, another Hexagon product. AKMS is a knowledge management system built with process industries in mind. This solution doesn't only store your documents, it lets you easily manage and govern the critical operational content your field workers use every day. This integration should bring about easier designing of policies and activities into EAM. HxGN Databridge Pro is utilized to assist with many of the data interactions between AKMS and EAM for this integration. The diagram below illustrates the order in which the three systems interact.



Databridge Pro initially retrieves information about AKMS Content (including procedures) and pushes it into EAM. It also continually checks for updates in AKMS regarding Content and EAM initiated Completions and updates the references in EAM to maintain synchronization. Wherever EAM users initiate a new AKMS Completion (possible in most Checklist tabs/screens and all the Documents List tabs), it is done directly with AKMS, not facilitated by Databridge Pro.

Both types of AKMS data (Content and Completions) are leveraged within the pre-existing Documents entity of EAM. All areas of EAM where you can view documents were updated to ensure user is taken to AKMS itself when attempting to view AKMS related Documents which users might associate. In addition, most Checklist tabs and screens are enhanced with fields supporting this

feature, as this is a logical placement to ensure that procedural AKMS Content is executed with AKMS Completion creation.

Design Assumptions

Personal AKMS Credentials

When a user attempts to view AKMS Content or Completion documents in EAM, a new window is opened to direct user to the record in the AKMS application. If the user is not already logged in with an active session, they will be required to authenticate using their personal AKMS credentials.

Multiple AKMS Systems Support

In some situations, an EAM system may require using data from multiple AKMS systems. This is supported by allowing different AKMS systems at the Organization level in EAM and facilitated by AKMS connection information being set in the Options tab of the EAM Organization screen.

There are a variety of ways to map the data from the AKMS system(s) to EAM Organizations.

- One AKMS system to one organization in EAM (like * organization).
- One AKMS system to multiple organizations in EAM, while ensuring the AKMS system data is segregated across the organizations to avoid duplicate record errors during processing.
    - For instance, use the Domain property in AKMS to segregate; only push Domain1 Content data into ORG1 of EAM, and Domain2 Content data into ORG2.
- Multiple AKMS systems, each pointing to one or more organizations in EAM.
    - If any one of the AKMS systems points to more than one organization in EAM, as above, data segregation would be required to avoid duplicate record errors.

AKMS

The following section summarizes basic configuration requirements in AKMS for this integration. These steps assume that there is just one AKMS system being utilized for the integration of a single EAM system. If more than one AKMS system is utilized, these activities will need to be carried out in each one.

***Note**: To facilitate this integration, AKMS has not been updated in any way. Pre-existing APIs were utilized.*

URL

1. Establish the AKMS system URL to be used for the integration.
2. Make a note this URL for later use in the setup steps.
    a. For example: https://dev.acceleratorkms.com/TestCorp

API Users

This integration requires two API users that need to be administered from AKMS.

- One API user that is dedicated for HxGN EAM application. This API user requires the necessary permissions to be able to create completions in the AKMS application.
- A second API user, dedicated specifically for Databridge Pro. This API User will be used to make content and completion search calls.

Both API users need to have appropriate Domain\Role settings which will allow the actions described for the Content intended to be used for the integration.

Note : The API credentials (i.e. User IDs and passwords) are required to complete the setup in both EAM and Databridge Pro.

Personal Credentials

- **Resuming Completions** - EAM users that will be using the integration with AKMS to initiate new completions and complete them in AKMS will need to ensure their personal AKMS credentials are set up to have appropriate Domain\Role settings. The settings must allow the user(s) to resume completions initiated in EAM by utilizing the Join option in AKMS. The AKMS API user created for EAM to use and assigned in the AKMSUSER Org. Option will always be automatically assigned to the Completions initiated in EAM, but it is expected that different individual users will resume or be assigned to those completions. See more information in the AKMS Help describing the need for these users to have a role assigned which includes the Complete Content operation.
- **Viewing Content and Completions** – EAM users that will be using the integration to just view Content and/or Completions will also need to have appropriate Domain\Role settings assigned to their personal AKMS credentials for that purpose.
- **Assigning Users to Completions** – For EAM users that will be using the integration to initiate new completions and assign other AKMS users (using the Manage feature in AKMS) for carrying out the steps to completion: the same guidelines above apply for these other AKMS users, and the EAM user who initiated the completion will need appropriate settings assigned to their personal AKMS credentials to utilize the Manage feature in AKMS.

Security Timeout Value

It is recommended that the SecurityTimeoutMinutes value in the AKMS Configuration screen to be no less than 20 minutes.

EAM

This section is focused on the configuration activities within the EAM application and the impacts to its various screens.

Configuring EAM

This section describes the steps which need to occur in EAM to fully utilize the integration. Some activities are optional and described as such.

Note: *Navigation to the screens is not described as it may be different in your menus. If unsure where to locate, you may utilize the handy Jump to Screen feature which can be launched with CTRL+F2 and the screen codes provided in parentheses within this section.*

Note: *As best practice, system delivered Dataspies and Screen Designer settings should only be updated by a system administrator to ensure integrity of the data being used.*

User Setup Screen

An EAM API user is required to authenticate and authorize Databridge Pro access to a HxGN EAM tenant. The following steps are required to complete this setup

1. Create a user on the User Setup screen (BSUSER). The user should be administered against the appropriate group that has administrative privileges to HxGN EAM Documents.

2. For this setup it is required that the language setting for the API User is equivalent to the DEFLANG parameter of EAM. E.g. EN for English. Select the user's language setting in the language field.

   It is also required that the system DEFLANG is the same default system language system settings as AKMS. This ensures that both systems are integrating metadata in a common language. Multiple language translations against the integrated meta data are supported and is described in the Adding and Removing Language Translations section.

3. The API user should have access to the organization where AKMS Document content data needs to be created and updated. For example, the '*' Common organization. Navigate to the Organization tab and administer the appropriate organization such as '*'.

Note: If more than one organization will be targeted for holding AKMS Content data, associations for each organization should be made. (Multiple EAM API users are not necessary.)

4. In addition, the API user should have the Connector check box selected, which allows the user to make API calls.

Integration Configuration Screen

Databridge Pro will use the EAM API user to make REST API calls. For authentication, an API Key is required to authenticate the EAM API user with the HxGN EAM tenant.

1. Navigate to the Integration Configuration screen (Screen Code: BSIGCC). On the record view tab of this screen, select the Application Name as EAM API. This will default the selection for Grant type to Client Credentials with the Active checkbox checked.

***Note**: If the EAM API application entry was previously created. The Grant type would have had the value of Authenication. For the purpose of this integration, this value would not impact the steps required for generating an api keys in the API Key Management tab.*

2. Navigate to the API Key Management tab and in the User ID field, select the EAM API user created in the User Setup Screen section. Save the record.

    a. Focus on the saved record and generate the API Key using the Generate API Key option in the Actions menu. The system will popup a message with the generated API Key.

    IMPORTANT: Copy this key and save it to a secured location. This key is only shown once by EAM. The API Key will later be used to configure Dataflow studio processors.

Organization Screen

The Options tab on the Organizations screen (BSORGS) will need to have appropriate AKMS URL and credential data populated for the organization(s) which will hold the AKMS related documents.

As described earlier, there are several options available for mapping the AKMS data to organizations in one EAM system.

- One AKMS system to one organization in EAM (like * organization).
- One AKMS system to multiple organizations in EAM, while ensuring the AKMS system data is segregated across the organizations to avoid duplicate record errors during processing.
    - For instance, use the Domain property in AKMS to segregate; only push Domain1 Content data into ORG1 of EAM, and Domain2 Content data into ORG2.
- Multiple AKMS systems, each pointing to one or more organizations in EAM.
    - If any one of the AKMS systems points to more than one organization in EAM, as above, data segregation would be required to avoid duplicate record errors.

When providing the three Org. Option values listed below, utilize the information collected in the earlier setup section for AKMS.

You will need to provide values for three records found in the Options tab of the Organizations screen. See list below along with details and/or advice for each.

- **Option 1 - AKMSURL**
    - For viewing Content and viewing/creating Completions.
    - Sample: https://acme.acceleratorkms.com/acme
    - **Note**: If this value needs to be changed to a new valid value when the old original URL value is also still valid, it is recommended that you do one of the following:
        - Notify users when making this change to not attempt to start/create a completion for the next 20 minutes to ensure any token which exists (using the old original URL value) expires.
        - Implement changes in off-hours when users would not be using the Start/View AKMS Completion feature.
- **Option 2 - AKMSUSER**
    - Used only for Completion creation.
    - Ensure user has appropriate domain/role abilities in AKMS for creation completion. This would be the AKMS API user created for EAM's use and saved aside in prior AKMS section.
    - EAM will be accessing AKMS for Completion creation using bearer token password grant type. The token expires after 20 minutes. If a token request had been successful during the Completion creation process using the value in this field and it is not expired yet, the system will continue to use the token for the Organization for up to 20 minutes. It would need to expire before the system uses any new value which might be provided for AKMSUSER. See more detail on the tokenization process in the Documents List tabs section.
- **Option 3 - AKMSPWD**
    - Password value corresponding to the user value given for AKMSUSER option.
    - Used only for Completion creation.
    - Encrypted on save.
    - If the API user in AKMS created for EAM is a standard account, be sure to update this AKMSPWD Org. Option whenever periodic required password resets are carried out in AKMS. This also applies if a service account is used instead, but password resets are not typically required for the service user accounts.

Documents Screen

1. Databridge Pro uses EAM Grid API calls to navigate and obtain EAM data leveraging the system delivered 'AKMS Documents' dataspy. On the BSDOCU List view, select the 'AKMS

Documents' dataspy, and edit the dataspy to include the following additional EAM fields and save the dataspy.

- AKMS Date Updated

The AKMS Date Updated field is used by Databridge Pro in addition to other AKMS Fields to synchronize documents between AKMS and EAM.

Note: The next step and the remaining steps in the EAM configuration sections are not required but should be considered to fully utilize the changes implemented for this integration.

2. Using Screen Designer mode, consider the following steps to surface protected fields related to AKMS on the Record View tab of the Documents screen (BSDOCU).
   a) Unhide the External System Details block itself.
   b) Unhide these protected fields within this block beginning as AKMS if/as desired:
      i. AKMS Type
      ii. AKMS GUID
      iii. AKMS Domain
      iv. AKMS Status
      v. AKMS Completion Number
      vi. AKMS Parent
      vii. AKMS Completed Date
      viii. AKMS Cancelled Date
      ix. AKMS Created By
      x. AKMS Date Created
      xi. AKMS Updated By
      xii. AKMS Date Updated

Task Plan Screen

Per your organization's needs, use Screen Designer mode within the Checklist tab of the Task Plans screen (WSTASK) and consider unhiding the following fields:

1. AKMS Content
2. AKMS Content Description
3. AKMS Completion Required

Various Operational Screens

In the following operational screens/tabs, consider which are used by your organization and whether you could leverage using the integration with AKMS via use of AKMS fields in Task Plan Checklists. If yes, the Dataspy(ies) for each will need to be updated in the Layout tab to pull in the three AKMS fields if/as desired:

1. AKMS Content
2. AKMS Content Description
3. AKMS Completion Required

Screen Name (and tab)	Screen Code
Work Orders | Checklist tab	WSJOBS *
Permit to Work | Checklist tab	WSPMTW
Case Management | Checklist tab	CSCASE *
Case Management Tasks | Checklist tab	CSCMTK *
Nonconformities | Checklist tab	OSNCHD
Nonconformities Observations | Checklist tab	OSNCFM
Assets | Checklists tab	OSOBJA *
Positions | Checklists tab	OSOBJP *
Systems | Checklists tab	OSOBJS *
Locations | Checklists tab	OSOBJL *
Operator Checklist	WSOPCL
Review Operator Checklist	WSOPCK
Contractor Portal | Checklist tab	WSCOPO

* - These screens should also be considered for additional updates to their Documents List tab as outlined in next section.

To better track the status of any AKMS Completion document a user might create/link to a checklist item, you should consider adding the AKMS Status field (or other AKMS related fields as desired) to the dataspy of the shared popup list grid invoked in any of the above screens/tabs via ‘Add/Edit Checklist Item Documents’.

Documents List tabs

The Documents List tab is offered in 8 screens (listed below). In each of these screens, this tab will offer the ability to link AKMS Content documents and AKMS Completion documents can be started/linked against them as well if/as needed. (Starting AKMS Completions from EAM is described in full later in this brief.)

1. Work Orders (WSJOBS)
2. Purchase Orders (PSPORD)
3. Case Management (CSCASE)
4. Case Management Tasks (CSCMTK)
5. Assets (OSOBJA)
6. Positions (OSOBJP)
7. Systems (OSOBJS)
8. Locations (OSOBJL)

If you anticipate creating AKMS Completions in the Documents Lists tab of any of the above screens you should consider updating the dataspy(ies) where relevant to pull in the AKMS related fields if/as desired using the Layout tab, especially the ‘AKMS Status’ field.

Areas of Impact in EAM

This section outlines the various screens and tabs which are affected by the integration with AKMS, some of which are already touched on due to configuration changes outlined in prior section.

Documents screen

- AKMS records (Content and Completions) will appear in the Documents screen.
    - Content data (which could include procedures) is extracted from AKMS and brought into EAM via Databridge Pro processing.
    - Completion data is created by EAM itself via processes invoked in other EAM screens; more details outlined later in this brief.
- Most AKMS Related fields are in the External System Details block, all beginning with ‘AKMS’. Other fields in the Documents screen are also utilized by the integration.
    - The fields beginning as AKMS are always protected in the UI.
    - When the ‘AKMS Type’ field has a value, these fields are protected in the UI.
        - Description

- Title
- Revision Number
- Revision Date
- File Type (Not used by integration. Should always be left blank)
- File Path (Not used by integration. Should always be left blank)
- Expiration Date

  - See Appendix A - Solution Integration Mapping for the full list of fields and related comments.

- Updates which occur to these Content and Completion documents within AKMS are detected via Databridge Pro processes and pushed into EAM, most notably for Completions: the AKMS Status field, which will flow through statuses such as Not Started, Partially Completed, and Completed.
- A Dataspy, 'AKMS Documents' is delivered with the product dedicated to only showing AKMS documents and many of the AKMS fields are utilized.

Viewing AKMS related documents

When users attempt to view an AKMS Content or Completion document from within any screen, tab, or menu option in EAM, the system uses the document's Organization to locate the value set for the AKMSURL Org. Option. The system then appends the URL with two elements to launch AKMS in a new window for the user to view and/or work on the Content or Completion item within AKMS itself. This may require the user to login to AKMS with their personal AKMS credentials if they don't already have an active session.

- If AKMS Type = Content (AKMS) then URL is appended with '/Content/' and the GUID:

  <AKMSURL Organization Option>/Content/<AKMS GUID value on the document being viewed>

  For example:

  https://dev.acceleratorkms.com/TestCorp/Content/02db1338-fd44-4b56-a3ce-9c1b8fc9edbd

- If AKMS Type = Completion (AKMC) then URL is appended with '/completions/' and the GUID:

  <AKMSURL Organization Option>/completions/<AKMS GUID value on the document being viewed>

  For example:

  https://dev.acceleratorkms.com/TestCorp/completions/ee9f430f-016c-418c-8713-99b0ec971846

This logic will be utilized in all scenarios available for viewing documents as listed below:

- **View Document** - Relevant throughout the product, and sometimes invoked with mouse click(s) on a record/line in addition to selection of 'View Document' action item.
  - Documents screen

        - Documents tabs
        - Documents List tabs
        - Document related popups. For example: ‘Add/Edit Checklist Documents’ popup available on Checklist screens/tabs
    - **Start/View AKMS Completion** – relevant in 2 contexts
        - Documents List tabs
        - Most all Checklist screens/tabs
    - **View AKMS Content** – relevant only in Checklist screens/tabs

Documents tabs/popups

This section concerns the Documents tab on most all screens of EAM and Document popups where user can link existing documents.

- User may manually link any pre-existing AKMS Content document pushed into EAM, and each may be linked more than once.
- AKMS Completions cannot be manually linked; they are hidden in the Lookup. But they may show up in the Documents tab and popups by use of an Action Link option for **Start/View AKMS Completion** initiated in other screens and tabs described later in this brief. Each Completion will not be linked to more than one record, as can be confirmed in Documents screen’s Where Used tab.

Documents List tabs

This section concerns the Documents List tab available in a few screens like Work Orders, Purchase Orders and Case Management Tasks.

- User may manually link any pre-existing AKMS Content document pushed into EAM, and each may be linked to multiple records.
- **Start/View AKMS Completion** - User may initiate an AKMS Completion by focusing on an already linked AKMS Content document in the Document List tab and selecting the Action Link for **Start/View AKMS Completion**.
    - Launching this results in a new Completion created in AKMS as well as in EAM along with an association to the current header record in EAM. Even if focused on an AKMS Content record having Source columns filled in, the new Completion is associated to the header record, not the source record where the AKMS Content is associated. For example:
        - AKMS-10001 Content document is associated to a Department record DEPT1

- DEPT1 is referenced in the Department field of the Assets screen for BOILER-01 record
- When user navigates to the Documents List tab in the Assets screen they will see AKMS-10001 Content document with Source columns filled with Department/DEPT1 values.
- If user is focused on this AKMS-10001 Content document when selecting **Start/View AKMS Completion**, the resulting completion document association is with the BOILER-01 record itself (not associated to the AKMS-10001 document or the DEPT1 department); and its Source columns will be empty.

See details of how this is accomplished in the steps below.

1. EAM looks to see if there is an unexpired token for the Organization of the focused AKMS Content document. If yes, system skips to step 5.
2. EAM uses the Organization of the focused AKMS Content document in EAM to lookup the AKMSURL, AKMSUSER, and AKMSPWD values set for that Organization.
3. Next, a token will be requested by EAM using HTTP POST. The API call is sent to the value in AKMSURL and appended with '/token'. The body of the post sends 3 elements:

Key	Value
grant_type	password
username	<relevant AKMSUSER Org Option value>
password	<relevant AKMSPWD Org Option value, decrypted. Not the encrypted value>

Sample body:

```
grant_type=password&username=EAMAPI_USER&password=TT73nvT5
```

4. AKMS will send back a token value in the response to EAM. EAM will keep track of:
    a. token value
    b. date/time it will expire
    c. Organization it was created for
    d. AKMSURL it was created against
5. EAM will then use the token to send a call to create the Completion. It uses the AKMSURL value from the token data, but appended with '`api/Completions/Create`'. Besides sending the token value to AKMS, it will also declare a 'ContentID' value which is the AKMS GUID value

from the focused AKMS Content document. In addition, a contextual reference about the EAM record where the Completion will be associated is declared with a 'WorkOrderNumber(Optional)' value.

- **Note**: the token value will be re-used for up to 20 minutes at which time it expires. If any EAM user tries creating a new completion for the same Organization before that time is up, then the earlier token request steps 2 - 4 are skipped.

6. AKMS will send back a response with information about the new completion it created.
7. EAM will use that response data to assist with some of the data fields when it creates its related AKMS Completion Document in EAM and associates it to the header record. (The synchronization processes of Databridge Pro will continue to update this record further.)
    - The name assigned to the new Completion document will begin with the name of the AKMS Content document in focus when creating the Completion followed by an auto-incremented integer. For instance, if focused on content document named 'AKMS-10022' and there is no Completion in EAM yet for this document, it will be named 'AKMS-10022-1'. If any user creates another completion against AKMS-10022 later on, it will be given a name of AKMS-10022-2, and so on.
    - See more details about the AKMS Completion fields in Appendix A – Solution Integration Mapping.

- System also launches a new window for user to view and work on the new Completion record in the AKMS application itself.
    - When viewing the Completion in AKMS, user will see that there is a contextual reference in the Work Order field starting as EAM_CMP. It is followed by Entity Codes (user and system), Entity ID, and Organization Code information. Note that AKMS only has this one reference field (Work Order), so it may contain a reference to entities in EAM other than work order, as when invoked while on the Documents List tab for BOILER-001 in the Assets screen, it would contain a value like: **EAM_CMP OBJ (OBJ) – BOILER-001 (ORG1)**
- **Note**: To see the newly created/associated Completion in EAM, user must refresh/run the Dataspy.

- **Note**: If a completion already exists and is associated to current record, system will only launch the AKMS application window and take user to the pre-existing Completion.
- **Reminder**: As mentioned in AKMS section, ensure the personal credentials of AKMS users have been setup to be allowed to resume completions of another user via the Join option in AKMS.

Task Plan screen \ Checklist tab

In the Checklist tab of the Task Plan screen, three related fields are on the checklist item:

- AKMS Content – lookup (optional)
- AKSM Content Description – (protected)
- AKMS Completion Required – checkbox (optional, but can't be selected if AKMS Content is empty)

The selections for these fields will impact operational screens downstream where these fields will be available as read-only.

Operational Screens having Checklist items

The main operational checklist related screens/tabs where changes are introduced for AKMS integration are listed below:

- Work Orders \ Checklist tab
- Permit to Work \ Checklist tab
- Case Management \ Checklist tab
- Case Management Tasks \ Checklist tab
- Nonconformities \ Checklist tab
- Nonconformity Observations \ Checklist tab
- Operator Checklist
- Review Operator Checklist
- Contractor Portal \ Checklist tab

The following features are implemented for these screens/tabs:

1. **Fields:** Three read-only fields are on checklist items for the above screens and get populated by the values set on checklist items of the related Task Plan record at the time the operational record was created:
    - AKMS Content
    - AKMS Content Description
    - AKMS Completion Required
2. Action Link for **View AKMS Content**
    - If invoked when focused on a checklist item having a value in the AKMS Content field, EAM launches a new window to view the content in the AKMS application.
3. Action Link for **Start/View AKMS Completion**

- If invoked when focused on a checklist item having a value in AKMS Content field, system behaves as described earlier for *Documents List tabs*:
    - EAM will create a new Completion record in AKMS and in EAM along with an association to the current checklist item.
    - The system also launches a new window for user to view and work on the new Completion record in the AKMS application.
    - If a completion already exists and is associated to current checklist item, instead of creating a new completion, system will only launch the AKMS application window and take user to the existing completion.
- But there are a few differences when dealing with this action in the Checklist context vs when in a Documents List tab:
    - In EAM side, the new Completion document can be seen in a Documents popup by clicking the **Add/Edit Checklist Item Documents** Action Link while focused on the checklist item.
    - The contextual reference logged in the Work Order field of the Completion in AKMS which begins as 'EAM_CMP' will always have a system entity code ending with CL (for checklist), and the Entity ID will be the Checklist Item ID value, not the ID of the Header record.
        - For example:
            - when Completion is initiated from a checklist item on Work Order (ID 10015) having a checklist Item ID of 10066, it would contain a value like:
                - EAM_CMP WACL (WACL) - 10066 (ORG1)
            - Similarly, when initiated from a checklist item on a Permit to Work record (ID 10003) having checklist Item ID of 10022, it would contain a value like:
                - EAM_CMP PWCL (PWCL) - 10022 (ORG1)

4. **Validation**: If a checklist item exists where the AKMS Completion Required checkbox is selected but there is no related AKMS Completion with AKMS Status equal to completed, then you cannot close the work order or the permit to work for example.

   Note: Remember, to avoid this error you must:

   1) Ensure the Completion is updated in AKMS itself to a Status of Completed.
   2) Ensure that the processors in Databridge Pro which search for Completion updates from AKMS and send them to EAM are activated and there are no processor errors.

In addition, the Checklists tab on the four Equipment screens are impacted as above but without the Start/View AKMS Completion and Validation functionality. These screens have additional columns (AKMS Content, AKMS Content Description and AKMS Completion Required) and the View AKMS Content Action Link.

- Assets \ Checklists tab
- Positions \ Checklists tab
- Systems \ Checklists tab
- Locations \ Checklists tab

HxGN EAM Digital Work

Various equivalent screens within Digital Work (EAM's powerful mobile connected platform) were also updated to ensure the same AKMS related abilities described above are available.

Limitations

The following screens have no AKMS support:

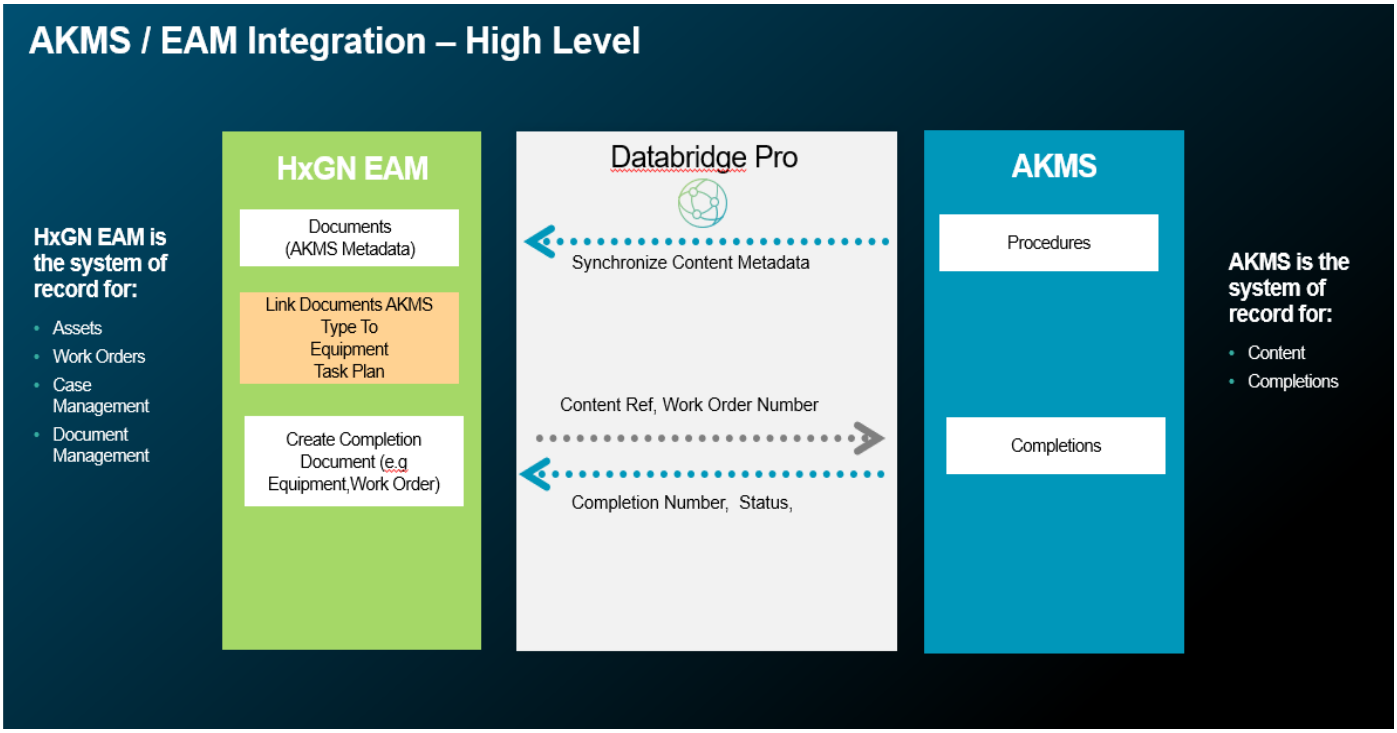
- The View Checklist Items action link from either the Operator Checklist or the Work Order Checklist tab of the Equipment screens (Assets/Systems/Positions/Locations)
- The Checklists tab for the Job Plans screen

Databridge Pro

This section describes the actions to prepare and deploy the necessary components of Databridge Pro for the integration between EAM and AKMS.

Configuring Dataflow Studio

The following diagram illustrates the integration and data flow between EAM and AKMS.



The integration of EAM and AKMS, is architected and deployed with the concept of AKMS as the system of record for an organizations procedures and completions. Completions are crucial for maintaining an audit trail, tracking progress, and ensuring compliance with regulatory requirements. They help in identifying who made changes, what changes were made and when they occurred, thereby providing transparency and accountability in the management of procedures.

HxGN EAM enforces the compliance of various operational procedures against assets, specific work, maintenance and case management tasks to be completed.

AKMS procedure records in HxGN EAM are linked to task oriented activities such as work orders and checklists, which then allows the user to jump directly to the procedure in the AKMS application and view it. This linkage also allows the user to create a completion in AKMS from HxGN EAM to then follow and acknowledge the steps required to finish the document.

Databridge Pro is the middleware solution that enables the integration between HxGN EAM and AKMS. It synchronizes AKMS content metadata and completion status by domain with HxGN EAM organization documents. This furher enables users to search and cross reference AKMS procedures and completions from within HxGN EAM and maintains procedure version control with AKMS.

Dataflow Studio, a component of Databridge Pro, is a cloud web-based graphical UI where you design, configure, and monitor dataflows between any applications. For an in depth overview of Dataflow Studio, refer to the HxGN Databridge Pro brief.

Appendix A – Solution Integration Mapping provides a complete field list and mapping of the integration.

Dataflow Studio Flow Definitions

Dataflow Studio supports the ability to create, download, and import flow definitions. Flow definitions offer a way to share flow configurations for enhanced consistency and implementation between Databridge Pro environments.

The pipeline for synchronizing AKMS Content and Completion status to EAM has been delivered in a flow definition. The flow definition is available in the Smart Community Developer Portal. The flow definition is grouped into a single overall processor group called AKMS to EAM and configured for a 1:1 pairing between an HxGN EAM organization to an associated AKMS Domain.

Processor groups in Dataflow studio allow you to group related processes and their connections together for better flow management. It provides a way to manage the scope of dataflows and isolate them from other processor groups. This allows you to set different timed frequencies to when integrations should occur. Processor groups can also be nested to further break down and group the data processing logic.

For each AKMS Domain that needs to be integrated, a copy of the AKMS to EAM processor group needs to be created, named and configured appropriately to reflect the appropriate organization and domain pairing.

For example, an organization ACME has a single AKMS system with three AKMS Domains defined. Each domain corresponds to a particular ACME operating location, i.e. Houston TX, Duluth, GA, Seattle, WA. The requirements are to integrate content data from the Houston and Duluth domains into ACME’s HxGN EAM solution. HxGN EAM has been configured with a single organization, named ACME.

To facilitate this integration, a processor group definition for the respective locations with HxGN EAM will need to be created. A processor group file that supports the integration between ACME

organization in EAM and the AKMS Houston, TX domain and another between the ACME organization in EAM and the AKMS Duluth, GA domain.

Alternatively, if the requirement was to integrate all domain content of ACME, the option to map the ACME EAM organization with the entire AKMS global domain is also possible. This would be the best method if there was no need to integrate domain specific content in AKMS.

Importing Flow Definition

From the Smart Community Developer Portal, download the AKMS to EAM.json flow file definition and perform the following steps.

1. Import the AKMS to EAM.json flow file into Dataflow studio by drag and dropping the processor group icon onto the canvas from the component toolbar.
2. In the Process Group dialog box, click the **Browse** button. Select the flow definition to import from your local directory. The Processor Group name will default as the flow definition name. After selection of the flow definition, the Process Group Name can be edited at this step.
3. Select the AKMS to EAM.json flow file to be imported from the file browser.
4. Click **Add.**

Dataflow Use Cases

The data flow between AKMS and EAM is comprised of two major flows. The content flow and the completion flow. The Databridge Pro template defines these as follows:

Content Data Flow

This flow has two use case options. These are defined as follows:

Use Case 1: Synchronize all published content from AKMS. This flow is to be chosen in the case when all published content from AKMS is to be integrated with HxGN EAM. It is initiated with the GenerateFlowFile processor named **Complete Content Sync by Domain**.

Use Case 2: Synchronize a subset of published content from AKMS. This flow is to be considered in the case where only a subset of published content from AKMS needs to be integrated with HxGN EAM. AKMS offers the ability to filter out published content based on a predefined date. For Example – Synchronizing all published content post Jan 1, 2022. It is initiated with the GenerateFlowFile processor named **Content Sync by Domain and Date**.

IMPORTANT: Only One of these two use case flows need to be configured and activated for this integration.

Completion Data Flow

The completion data flow has only one option and that is the last use case and required to be configured and activated for the integration. This is defined as use case 3 in the template:

Use Case 3: Synchronize completion status from AKMS. This flow synchronizes the status of completions created from HxGN EAM with the updated status of completions in AKMS. It is initiated by the GenerateFlowFile processor named **Full Sync by Domain Completions**.

Configure Parameter Contexts

Parameter contexts are a feature that is used to centralize and manage configuration values called parameters. Parameters can be reused across multiple processors, controller services and other components. It is essentially a container of key-value pairs. The following key value pairs need to be created in **AKMS to EAM** processor group.

1. Select the upper right main menu in Data flow studio and select the option for Parameter contexts.

2. Select (+) to add a new Parameter Context. Enter **AKMS To EAM** as the name and enter a brief description for this context.

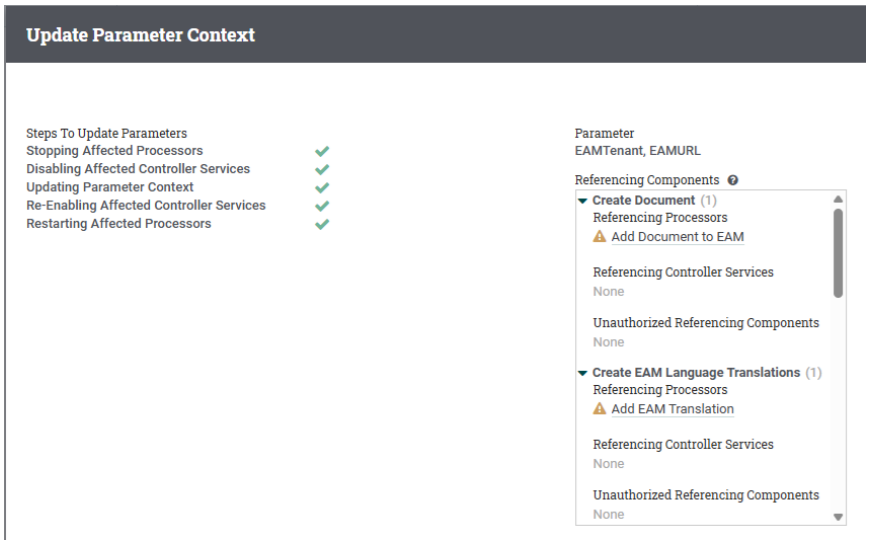
3. Select the Parameters tab and using the (+) add the following parameters shown below with the appropriate values specific to your environment in the **Values** text box. Select the option of the value as sensitive as indicated in the table below.

NOTE: The parameter values are case sensitive.

Parameter Name	Description	Sensitive Value
EAMOrg	EAM organization	
EAMTenant	Tenant name of the EAM environment	
EAMURL	EAM rest services URL	
EAMUsername	EAM API username	
x-api-key	EAM API key value	Yes
AKMSStatus	Status of the Content Documents from AKMS. Set as “Published”, “Archived”	
AKMSUrl	AKMS environment URL	
AKMSTokenAuth	AKMS rest service URL for the authentication token, usually in the format: *https://AcceleratorKMS_URL/token*	
AKMSUsername	AKMS API Username	
AKMSPassword	AKMS Password of AKMSUsername	Yes
DomainId	AKMS Domain GUID from which to synchronize the content metadata	

Parameter Name	Description	Sensitive Value
ModifiedStartDateCustom	AKMS Modified Date used to filter synchronization of content. Valid only if using Use Case 2	
emailServer	SMTP server to authenticate and send emails from Log Messages	
emailsFrom	Sender's email address	
emailsTo	Email of recipients for log message emails	
SMTPUsername	Username for email authentication	
SMTPPassword	Password for email authentication	Yes

4. Once all the parameters are added, click the Apply button to verify the configuration. A successful verification is indicated by the green check marks on the left and warning icons to the right of the panel, which shows the list of **referencing components.** Below is an example of a failed verification, where the warning icons are reflected against the specific processors. To fix the errors, hover the warning icon to understand the error being reported. Navigate back to the parameter context menu and select the AKMS_TO_EAM parameter context to make corrections. Repeat as necessary until all warnings are cleared.



Enable Controller Services

Controller services in Dataflow studio are shared resources that can be used by multiple components within a dataflow. They provide a centralized configuration and offer functionality that can be leveraged by processors, reporting tasks and other services. Some examples are database connection pools, SSL context and token services.

A controller service has already been pre-configured for this integration. The parameter details configured in the previous section will be applied to enable the service.

To enable the controller services, follow the steps below

Steps:

1. From the canvas, Click and select the gear icon (⚙) from the **Operate** panel. This action will launch the **controller services** tab.
2. Select the **AKMSTemplate-StandardOauth2AccessTokenProvider**.This service manages the Oauth 2.0 authentication to obtain access tokens for secure API interactions with AKMS. The default current token resource limit is set to 20 mins (1199s)
3. Enable the service and referencing components by clicking the (⚡) icon.
4. Close the configuration.

Configure Content Language Translations

NOTE: *If there are no multi-language translations for the content in AKMS, and DEFLANG of EAM is the same as the default language of AKMS, then this section to configure content language translations can be omitted, and the* ***Create EAM Language Translations and Update EAM Language Translations*** *processor groups can be turned off. See Deploying the Integration section*

AKMS supports multiple languages, specifically for the **content title** and **description** fields across all documents. In contrast, HxGN EAM only supports multi-language functionality for the description field.

To enable multi-language support in this integration, the AKMS **Title** field is mapped to the EAM **Description** field.

It is recommended that every translated language in AKMS has a corresponding EAM language code mapping. For instance, if AKMS content is translated into German, Spanish, and French, equivalent translations must be mapped using the respective EAM culture codes.

A 1:1 mapping between AKMS and EAM language codes is essential to prevent missing translation errors during the dataflow process.The table below is an example of the mapping between AKMS and EAM Culture codes

Language	AKMS Culture Code	EAM Culture Code
German	de	GE
Spanish	es	ES
French	fr_CA	FR

Adding and Removing Language Translations

The **AKMS to EAM** flow file definition template includes a set of default mappings for culture codes, which can be customized based on specific implementation needs.

Language extraction and transformation from AKMS, along with synchronization with EAM translations, are handled by the **Create EAM Language Translation** and **Update EAM Language Translations** processor groups.

To add a new translated language, you must first add a new property to the **Extract AKMS Title Translation** processor. This property should represent the AKMS culture code for the desired translation and follow a specific value format.

For example, to add Dutch as a translated language, use the AKMS culture code **nl.** The AKMS Content Search API provides a list of translated languages for the **title** and **description** fields. Databridge Pro evaluates the JSON payload returned by the AKMS API and extracts the translation for the **Titles** key using a JSONPath query. The extracted value is then assigned to **nl** property in the **Extract AKMS Title translation** processor.

For a complete list of supported culture codes refer to Appendix C – AKMS Culture Codes

Steps:

From the canvas, navigate to **Sync AKMS Content→ Create/Update EAM Documents→Create Document→Create EAM Language Translations**

The following steps needs to be completed to add a property in the above processor groups based for the translated content in AKMS

1) Double-click on the **Extract AKMS Title Translation processor.** Select the properties tab and **Add** property icon

2) In the property name field, enter the new culture code to be added to the extraction process. Example **nl**

3) In the value dialog box, enter the json path in the format **${AKMS_Titles:jsonPath('$.X)},** substituting the 'X' placeholder as the value of the culture code. Click **Ok** then **Apply** to save the changes.

   Below is an example of what the entry would look like for adding Dutch as a property.

Property	Value
nl	${AKMS_Titles:jsonPath('$.nl')}

4) Next, a json object entry needs to be created in the json file, that lists the language culture code and the associated description value from the AKMS json payload. This file is then used to build the json translation payload required by the EAM translation api.

   From the canvas, navigate to **Sync AKMS Content→ Create/Update EAM Documents→ Create Document→Create EAM Language Translations→Build JSON to Transform Language Objects.**

5) Double-click on the **Build JSON to Transform Language Objects.** Select the properties tab. Click and expand the value box of the **Replacement Value** property.

6) Enter the culture code in the following json object format and Click **Apply.**

```
{
    "Language" : "X",
    "Description" :"${Y:length():le(255):ifElse(${Y:escapeJson()},${Y: substring(0,255):escapeJson()})}"
}
```

Substitute the value **'X'** with the EAM culture code and the value of '**Y'** with the AKMS culture code. Using the Dutch language example this will be

```
{
    "Language" : "NL",
    "Description" : "${nl:length():le(255):ifElse(${nl:escapeJson()}, ${nl:substring(0,255):escapeJson()})}"
}
```

TIP*- Copy and paste an entry provided by the template and make the edits for culture codes as instructed.*

7) From the canvas, navigate to **Sync AKMS Content → Create/Update EAM Documents→ Update Document→Update EAM Language Translations** and repeat steps 1-6.

To remove language translations from the default template, simply remove the culture code entry contained between the brackets **{ }** from both the **Extract AKMS Title Translation processor** and **Build JSON to Transform Language Objects.**

LogMessage Processors

The LogMessage processor is a component in Dataflow studio that allows you to log details about data flowing though the dataflow pipeline. This processor is primarily used for debugging, monitoring, and troubleshooting purposes. Log processors are color coded in red. No configuration is required for this integration.

Deploying Integration

Initial Data Load of AKMS Content

The initial load of AKMS content data will depend on which use case of the content data flow being used. Only one of the provided content data flows, Use Case 1 or Use Case 2 will be active for any deployment.

The default method of loading metadata into EAM, is based on the configured **DomainId**, **AKMSStatus** and the **ModifiedStartDateCustom** variables. The latter applies only if using Use Case 2. If no prior AKMS content has been loaded into EAM, it is recommended that only Published content from AKMS is loaded i.e. **Status = 'Published'**. The current default value of **AKMSStatus** parameter needs to be modified to receive only Published content for an initial load.

Once an initial load has been completed, the Status parameter needs to be switched back to then include Archived Content. The entire integration flow can then be started on a defined schedule to poll AKMS for updates to the content. With the integration active, any previously published document that is archived by AKMS will be synchronized by the dataflow, as well as any new Published content will be added by the integration.

The following steps need to be followed to begin an initial load of AKMS Content into EAM.

Steps:

1. Navigate to the **AKMS to EAM** processor group. From the canvas, navigate to the **Parameter Contexts** menu from the canvas and select the **AKMS To EAM** context
2. Verify the **AKMSStatus** parameter value is set to **"Published".** Apply any changes and return to the canvas.
3. **OPTIONAL** – This applies to the situation if you are using Use Case 2. Modify the **ModifiedStartDateCustom** parameter value as needed.
4. From the canvas, right-click the **Sync AKMS Content** processor and select **Start**. This will start all the processors within this group. Navigate down the hierarchy of the processor group to ensure all processors are turned on and no system errors are being reported. If system errors are identified, stop the processor against which the error message is being reported by Dataflow Studio and resolve the issue, and restart the processor.

***TIP**: You can use right-click against each processor to stop and restart it.*

If language translations are not needed, then the **Create EAM Language Translation** and

Update EAM Language Translations processor groups need to be stopped.

5. Depending on which Use Case data flow is being used, Navigate to the appropriate GenerateFlowfile Processor. For example, if using Use Case 1, **Complete Content Sync by Domain**, Right click on the processor and select the **Run Once Option.**

   This will initiate a one-time flow execution for the dataflow. Observe the flowfiles processing through the hierarchy and chain of processors via **Sync AKMS Content** processor group. Ensure no errors are reported and all the flow files have completed execution.

   TIP : *You can use the Bulletin Board under Monitoring Menu selection to view any errors in real time*

   If errors are reported. Right-click on the canvas to stop the execution to troubleshoot and resolve the errors. Once the errors have been resolved. Right-click on the canvas to select **Empty all the queues** and repeat step 5 to execute the flowfile.

6. Once the flow file has completed executing, verify that the AKMS content metadata has been loaded into the Document Screen (BSDOCU) of EAM.

   ***TIP:** - You can use the AKMS Documents dataspy to view the results*

7. This completes the initial loading of content. The integration is now ready to commence at a defined schedule for synchronization. To prepare for this step, the **AKMSStatus** value needs to be modified to include both published and archived values. Navigate tot the **AKMSStatus** parameter and edit the value to read **“Published”,”Archived”**.

NOTE: The above steps need to be conducted for each Domian and org pairing that is configured.

Synchronization of AKMS with EAM

There are two primary data flows operate independently on a fixed schedule to synchronize data between AKMS and EAM.

The first is the **content data flow**, which transfers data from AKMS to EAM and is managed by the processors in the **Sync AKMS Content** processor group.

The second is the **completion status data flow**, also from AKMS to EAM, managed by the processors in the **Sync Completion Status From AKMS** group.

The **Sync AKMS Content** processor group asynchronously polls the AKMS Content Search API to retrieve all content metadata for a given AKMS domain. The API response is then split into individual records, each of which is evaluated to extract the required integration fields (refer to Appendix A).

These fields are stored as flow file attributes. The unique identifier for each content record, which is the AKMS Content GUID, is among these attributes and is used to help construct the JSON payload for the EAM Grid API.

Each AKMS record is identified by its GUID and compared against EAM to determine whether the corresponding content already exists.

- If the content **does not exist**, the data flow is routed to the **Create Document** sub-processor group to create a new EAM document using the metadata from AKMS.
- If the content **already exists**, additional attributes from the AKMS record are used to compare and update the relevant fields in EAM. These updates, including checks for available language translations from AKMS, are handled by the **Update Document** sub-processor group.

Similarly, the **Sync Completion Status from AKMS** processor group asynchronously polls the AKMS Completions API to retrieve all completion records for a specified domain. The API response is split into individual records, and each one is identified by its **AKMS Completion GUID**.

Each record is then compared against completion records in EAM where the **AKMSStatus** field is not marked as **"Completed".** Specifically, the EAM Grid API retrieves records with a status of **'Queued'**, **'Not Started'**, or **'Partially Completed'**. If a matching GUID is found between AKMS and EAM, the corresponding EAM record is updated with the latest completion status from AKMS.

IMPORTANT – The data flow only updates completion records that were originally created by EAM in AKMS. Any records created solely within AKMS are excluded from this process.

Define Data Synchronization Schedule

The synchronization of AKMS content is initiated by one of two **GenerateFlowFile** processors: **Complete Content Sync by Domain** or **Content Sync by Domain and Date**.
By default, these processors are scheduled to run **once daily**. The exact time of execution is determined automatically based on when the processor is started.

The synchronization of **AKMS Completions** is triggered by the **GenerateFlowFile** processor named **Full Sync by Domain Completions**. By default, this processor is scheduled to poll **every five minutes**, with the initial run time determined automatically based on when the processor is started.

IMPORTANT - The **minimum allowed polling interval** for completions is **30 seconds**, as enforced by the AKMS Completions API. Attempting to poll more frequently will result in an API error.

Modifying the Processor Schedule

You can modify the scheduling configuration of any processor in the data flow. The steps below use **Complete Content Sync by Domain** as an example, but the same process applies to other processors.

Steps:

1. On the canvas, locate the **Complete Content Sync by Domain** processor.
2. Right click on the processor and select **Configure.**

Go to the **Scheduling** tab. Under **Scheduling Strategy**, choose one of the following:

- **Timer Driven** – Runs at a regular interval defined in the **Run Schedule** field (in seconds, minutes, or days).
- **CRON Driven** – Runs at specific times based on a CRON expression entered in the **Run Schedule** field.

3. Enter the desired **Run Schedule**.
4. Click **Apply.**

Starting the Integration

To start the integration, complete the following steps

To start the integration, follow these steps:

1. Verify that the **Sync AKMS Content** and **Sync Completion Status from AKMS** processor groups are running without errors.
2. If no additional language translations are configured (as explained in the Configure Content Language Translations section), you can stop the following processor groups to optimize performance:
   - **Sync AKMS Content → Create/Update EAM Documents→ Create Document→Create EAM Language Translations.**
   - **Sync AKMS Content→Create/Update EAM Documents→Update Document->Update EAM Language Translations**.

   To stop them, navigate to each processor group, right-click, and select **Stop**.

3. Choose either the **Complete Content Sync by Domain** or **Content Sync by Domain and Date** processor (note: only one should be active at a time). Right-click the chosen processor and select **Start**.
4. Right-click the **Full Sync by Domain Completions** processor and select **Start**.

The integration data flow is now active and will run according to the configured schedule.

Integration Verification

This section describes how to verify the integration and address issues that may be encountered.

Ensuring Databridge Pro Receives Data

To verify that the **Databridge Pro** template is receiving data from EAM and AKMS API calls for synchronization, users can review the **data provenance** for any processor or use the **List Queue** option available in the context menu of connections between processors.

The main processor groups, **Sync AKMS Content** and **Sync Completion Status from AKMS**, consist of multiple processors that route, format, evaluate, and transform the flow file data attributes. Databridge Pro logs and records details about processor events related to the ingested data within the flow. This information is stored in the **data provenance repository**, which can be accessed by right-clicking any processor and selecting **View Data Provenance**.

Additionally, the data flow includes built-in email notifications to alert personnel of any errors or issues that arise during processing.

Appendices

Appendix A – Solution Integration Mapping

EAM Document Field	Comments	AKMS Content API Field	AKMS Completion API Field
Document (aka Code)	Not in AKMS itself. **AKMS Content** - EAM automatically generates a value prefixed with 'AKMS-' when creation requests come in via Web Services having an AKMS Type value and no document code value is specified. For example: AKMS-10001 **AKMS Completion** – EAM assigns this value as <name of focused AKMS Content document>-<auto-incremented integer> For example: AKMS-10001-1	*n/a*	*n/a*

EAM Document Field	Comments	AKMS Content API Field	AKMS Completion API Field
Organization	Not in AKMS itself. **AKMS Content:** Databridge Pro configuration must be done to assign an appropriate Organization value which pre-exists in EAM system. **AKMS Completion:** The organization value of the focused AKMS Content document will be used for the organization value of AKMS Completion documents when 'Start/View AKMS Completion' action link is invoked in EAM.	*n/a*	*n/a*
Description	It is notable that the Description value in EAM is derived from the Title value in AKMS. Conversely, the Title value in EAM is derived from the Description value in AKMS.	Title/s (Localized values in AKMS can be brought into EAM with proper configuration/mapping in Databridge Pro.)	Title
Title	Truncated if necessary - EAM supports 4000 characters, but relevant AKMS field supports 2G. It is notable that the Title value in EAM is derived from the Description value in AKMS. Conversely, the Description value in EAM is derived from the Title value in AKMS.	Description/s (Localized values in AKMS are **not** accommodated in EAM.)	Description
Type	Not in AKMS itself. 'F' will be the value assigned for AKMS documents in EAM, making them not relevant for Document Repository Request functionality.	*n/a*	*n/a*

EAM Document Field	Comments	AKMS Content API Field	AKMS Completion API Field
Revision Number		VersionNumber	Version
Revision Date	Not in AKMS itself, but EAM detects change to Revision Number value and updates this field with current date/time when it occurs.	*n/a*	*n/a*
Expiration Date		ExpiryDate	*n/a*
Created By	EAM-only. Not tied to data in AKMS.	*n/a*	*n/a*
Date Created	EAM-only. Not tied to data in AKMS.	*n/a*	*n/a*
Updated By	EAM-only. Not tied to data in AKMS.	*n/a*	*n/a*
Date Updated	EAM-only. Not tied to data in AKMS.	*n/a*	*n/a*
AKMS Type	See Appendix B for supported values.	*n/a*	*n/a*
AKMS GUID	EAM enforces this value be unique across all Document records.	Id	CompletionID
AKMS Domain	Truncated if necessary - EAM supports 255 characters, but relevant AKMS field supports 2G	ClassificationPath	ClassificationFullPath
AKMS Status	Not governed by EAM Status Authorizations. See Appendix B for supported values.	Status	Status
AKMS Completion Number	Used only for Completions. (Also utilized as part of the Document/Code value.) This value from AKMS is a combination of Year, Month, and an incremented number which resets each month. For example: 2025-04-0001	*n/a*	CompletionNumber

EAM Document Field	Comments	AKMS Content API Field	AKMS Completion API Field
AKMS Parent	Used only for Completions. It will contain the AKMS GUID value of the relevant AKMS Content record from which it was initiated.	*n/a*	ContentId
AKMS Completed Date	Used only for Completions.	*n/a*	CompletedDate
AKMS Cancelled Date	Used only for Completions.	*n/a*	CancelledDate
AKMS Created By	Not tied to EAM user data.	CreatedBy	*n/a*
AKMS Date Created		CreatedDate	CreatedDate
AKMS Updated By	Not tied to EAM user data.	ModifiedBy	*n/a*
AKMS Date Updated		ModifiedDate	*n/a*

Appendix B – EAM System Code Entities & Values

Field (Entity Code)	System Code	System Code Description
AKMS Type (AKTP)	AKMS	Content
	AKMC	Completion
AKMS Status (AKST)	QU	Not Started
	PCM	Partially Completed
	CM	Completed
	CN	Cancelled
	PUB	Published
	PPUB	Partially Published
	EX	Expired
	AR	Archived

Appendix C – AKMS Culture Codes

For reference below are all the supported AKMS Culture Codes

Language	Culture Code
Arabic	ar
Bangla	bn-IN
Chinese (Simplified)	zh
Danish	da
Dutch	nl
English	en-CA
French	fr-CA
German	de
Indonesian	id
Japanese	ja
Korean	ko
Norwegian	no
Portuguese	pt
Russian	ru
Spanish	es