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Workflow Manager

Workflow Manager 2016
Release Notes

12 July 2016

Introduction

Workflow Manager helps enterprises efficiently manage the Application Readiness and Software License Optimization processes to streamline the procurement, preparation, deployment, and ongoing management of applications. Workflow Manager maximizes productivity of the IT team by automating change management, asset management, and other ITIL processes as part of the enterprise application lifecycle.

When IT-wide processes such as preparing application for deployment, migrations, and license optimization are managed poorly, expensive errors can occur, resulting in costly delays, lost productivity, and overspending. Workflow Manager standardizes, coordinates, and streamlines the management of applications through the entire enterprise lifecycle, reducing costs and maximizing productivity.

Workflow Manager supports both AdminStudio Suite and FlexNet Manager Suite for Enterprises. IT teams of every size use Workflow Manager to coordinate software asset management—from application packaging and deployment, though software licensing and optimization after deployment. Workflow Manager can manage desktop management processes, such as preparing for Windows migrations and application virtualization, as well as procurement, auditing, and retirement of software assets.

New Features

Workflow Manager 2016 includes the following new features:

- Enhanced AdminStudio Integration

- Reporting Enhancements

- Workflow Manager Configuration Enhancements

- Workflow Manager Usability Enhancements

Enhanced AdminStudio Integration

Edition • *This feature is available when you have purchased AdminStudio Enterprise Edition.*

In previous releases, integrating Workflow Manager with AdminStudio required the use of the iPlugin interface and PowerShell. Using this form of integration usually required having a consultant write custom code in iPlugin. This solution was cumbersome and difficult to customize.

With the 2016 release, Workflow Manager now leverages AdminStudio's web APIs to provide out-of-the-box support for enhanced automation data elements/workflow steps that make it possible to execute many AdminStudio tasks, such as:

- Importing a package into the Application Catalog and performing testing

- Viewing test results

- Setting the target environment

- Setting packaging formats

- Setting distribution points

- Publishing applications

- Viewing reports

- Viewing and setting application properties

This enhanced integration helps AdminStudio users leverage the built-in functionality of Workflow Manager, including approvals, email, issues, conditional logic, custom pages, reports, and integration with AdminStudio Inventory and Rationalization and FlexNet Manager Suite.

You can edit the out-of-the-box automation templates or create new templates that incorporate these AdminStudio tasks by using the new AdminStudio-related workflow step types and data element data types.

Important • *AdminStudio does not need to be installed on the same machine as Workflow Manager to use this integration. The only requirement is that AdminStudio and Workflow Manager must be connected to the same Application Catalog database.*

The following new features have been added to enhance Workflow Manager's integration with AdminStudio:

- Selecting Existing AdminStudio Packages

- Importing New Packages into AdminStudio

- Testing Packages and Viewing Test Results

- Distributing Packages

- Specifying Package Formats and Target Environments

- Adding Reports to Workflow Requests

- Viewing and Setting AdminStudio Properties

- Global Automation Templates Updated to Use New AdminStudio Integration Features

Selecting Existing AdminStudio Packages

In Workflow Manager 2016, you can create a workflow step that prompts the requester to select existing packages from the AdminStudio Application Catalog. Once you associate packages with a workflow request, you can perform other AdminStudio tasks on those packages as part of subsequent workflow steps such as performing testing in AdminStudio, viewing test results, and distributing packages to specified distribution systems such as System Center Configuration Manager.

To create a workflow step that prompts the requester to select existing packages from an Application Catalog, you first create a data element with a data type of **Existing AdminStudio Package**.

Figure 1: Data Type of Existing AdminStudio Package

Next, you associate the data group containing that data element to a workflow step. When that workflow step is displayed to the requester, they will be prompted to click the **Click to select the package** button.

Data Entry

Enter or review the data that is submitted as part of this workflow step.

Page 1 of 1: Specify Package

Select package • :   Click to select the packages

Select the Package
None selected.

AdminStudio group • :

Submit

Figure 2: "Existing AdminStudio Package" Data Element in a Workflow Step / Initial View

When the requester clicks the **Click to select the package** button, the **Existing Packages in AdminStudio** page opens, which lists all packages in the AdminStudio Application Catalog.

Existing Packages in AdminStudio

Select the packages to add to the list.

Apply   Cancel

7 results returned   20 ▼ rows per page

Enter search text

	Package name
☐	AcroRead.msi
☐	BlackBerry.msi
☐	setup.msi
☐	Cognos DecisionStream.msi
☐	FileZilla_3.2.4.1_win32-setup.appv
☐	iMovie.dmg
☐	acad.msi

Figure 3: Existing Packages in AdminStudio Page

After the requester selects the packages they want to attach to the workflow request and clicks **Apply**, the selected packages are listed in the **Select the Package** table.

Figure 4: "Existing AdminStudio Package" Data Element in a Workflow Step / Packages Selected

When the requester clicks Submit, the packages are then associated with the workflow request and are available when invoking AdminStudio Integration tasks in subsequent workflow steps.

Importing New Packages into AdminStudio

Note • This feature requires that Workflow Manager be connected to the same Application Catalog database as AdminStudio.

Workflow Manager 2016 includes new data element data types and a workflow step type that enable you import new packages into the AdminStudio Application Catalog. Just like when existing AdminStudio packages are selected, once you import packages as part of a workflow step, you can perform other AdminStudio tasks on those packages as part of subsequent workflow steps such as performing testing in AdminStudio, viewing test results, and distributing packages to specified distribution systems such as System Center Configuration Manager.

This section describes the two methods of importing packages into AdminStudio, involving two new data element data types and a workflow step type that processes the import.
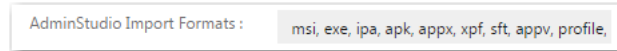
- Supported Deployment Types

- Uploading Individual Packages

- Uploading Packages from a Directory

- Creating a Workflow Step to Process the Import

Supported Deployment Types

Workflow Manager supports importing most of the deployment types that are supported by AdminStudio:

- Microsoft Windows Installer package (.msi)

- Installation package (.exe)

- Mac OS X disk image (.dmg)

- Mac OS X installer package (.pkg)

- Microsoft App-V virtual package (.sft, .appv)

- Symantec Workspace virtual package (.xpf)

- VMware ThinApp virtual package (.exe)

- Citrix XenApp virtual package (.profile)

- Apple iOS mobile application (.ipa)

- Microsoft Windows Store application (.appx)

- Google Android mobile application (.apk)

To specify the import formats you want to Workflow Manager to support, you can edit the **AdminStudio Import Formats** field on the new **Company Preferences** page. In this field, supported file extensions are listed, separated by commas.

AdminStudio Import Formats :   msi, exe, ipa, apk, appx, xpf, sft, appv, profile,

Figure 5: AdminStudio Import Formats Field on Company Preferences Page
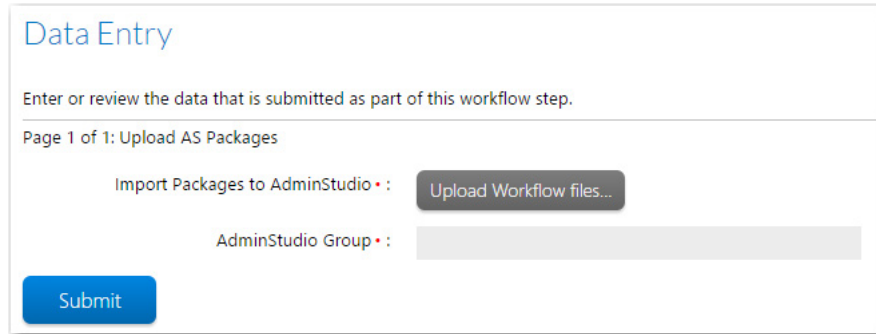
Note • For more information, see Ability to Configure Settings on New Company Preferences Page.

If you create a workflow step that includes the import of packages from a specified directory, Workflow Manager will only import the packages of the deployment types that are specified in the **AdminStudio Import Formats** field. By default, all supported deployment types are specified.

Uploading Individual Packages
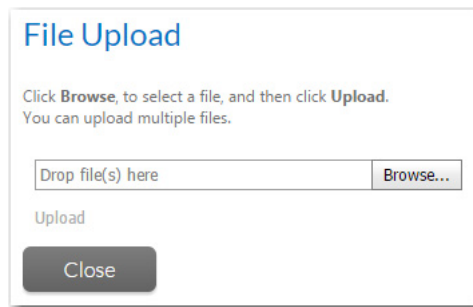
When you add a data element with a data type of **AdminStudio Package Upload** to a workflow template, and associate that data element with a workflow step, the requester is prompted to click a button to upload packages from any accessible location.

Figure 6: "AdminStudio Package Upload" Data Element in a Workflow Step

When the requester clicks the **Upload Workflow files** button, the **File Upload** dialog box opens.

Figure 7: File Upload Dialog Box / No Files Selected

On the **File Upload** dialog box, the requester can select multiple files by clicking **Browse** multiple times. All selected files will be listed.
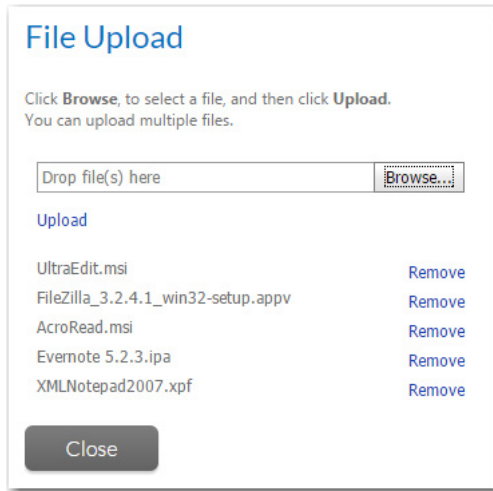
Figure 8: File Upload Dialog Box / Files Selected

When you have finished selecting files, click **Upload**. Progress messages will be listed.
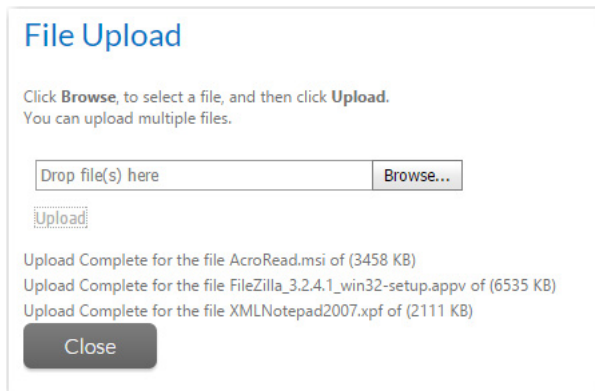
Figure 9: File Upload Dialog Box / Upload Complete

You then click **Close** to return to the workflow step and then click **Submit** to complete the step. At that point, a subsequent workflow step begins processing the import, as described in Creating a Workflow Step to Process the Import.

The **AdminStudio Package Upload** method is not recommended to import large packages because of the length of time it takes to upload and test, and also because it requires you to manually select all dependent files, such as **.mst** and **.cab** files. When importing larger files and files with dependent files, you should use the **AdminStudio Package Upload from Import Path** method, as described in Uploading Packages from a Directory.

Uploading Packages from a Directory

To solve the problems of importing large files and uploading all dependent files, you can instead add a data element with the data type of **AdminStudio Package Upload from Import Path** to a workflow template. When using this type of data element, dependent files are automatically imported along with the selected packages, and you are able to use Workflow Manager to perform other tasks while the files are being imported and tested. All packages of the specified deployment types in the selected directory will be imported.

With a data element with this data type, the user is first prompted to copy the files that they want to upload into the workflow-request-specific subdirectory, which was created automatically when the workflow request was created.

Figure 10: "AdminStudio Package Upload from Import Path" Data Element / Initial View

*Note • The root path to this import directory is specified in the **AdminStudio Import Base Directory** field on the new **Company Preferences** page. For more information, see Ability to Configure Settings on New Company Preferences Page.*

After the requester copies the packages to the correct location and clicks the Refresh button in the table heading row, those packages will be listed in a selection table.

Figure 11: "AdminStudio Package Upload from Import Path" Data Element / Files Listed

The files of the selected deployment types will be listed in the **Packages in Upload Directory** column, but dependent files (**.mst**, **.cab**, etc.) will not be listed.

After you click **Submit** to complete the step, a subsequent workflow step begins processing the import, as described in Creating a Workflow Step to Process the Import.

Creating a Workflow Step to Process the Import

After you create a data group containing a data element with a data type of **AdminStudio Package Upload** or **AdminStudio Package Upload from Import Path**, you need to first collect the data group in a workflow step. However, the actual import is automatically performed by a subsequent workflow step that references the "import" data element.

To create a workflow step to process the import of the specified packages, you need to create a subsequent workflow step with the new step type of **AdminStudio Integration** and the additional specification of **AdminStudio Task** of **Package Import**.

Figure 12: Defining an AdminStudio Integration Workflow Step

The **Package Import** task of an **AdminStudio Integration** workflow step type requires you to collect two parameters:

- **Group**—Select the data element that contains the name of the group in the Application Catalog into which to import the packages.

- **PackagePath**—Select the data element that instructed the user to select the packages to import.

When this workflow step is launched, packages are submitted for import one-by-one. This helps Workflow Manager support multiple users performing imports simultaneously and does not monopolize AdminStudio.

When the requester clicks **Submit**, the progress of the import is listed in the **Status** column.

Package Import is In progress
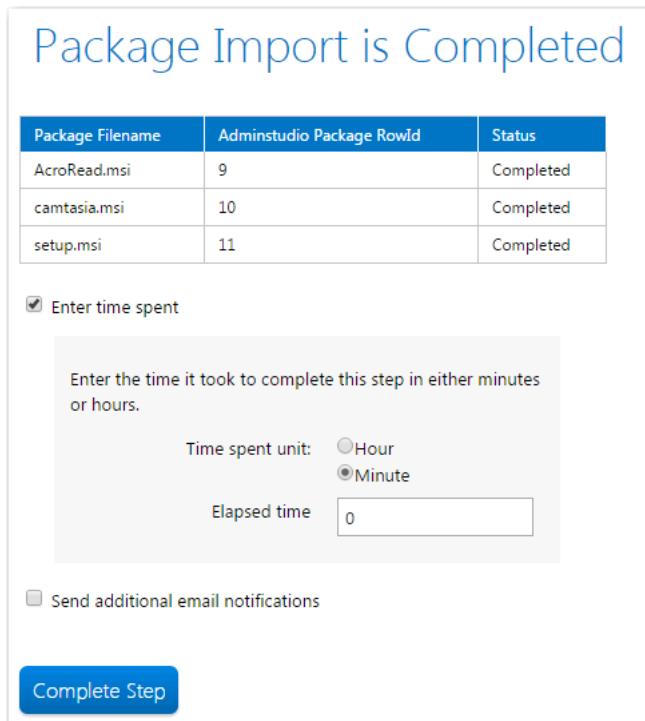
Package Filename	Adminstudio Package RowId	Status
AcroRead.msi	0	In progress
camtasia.msi	0	In progress
setup.msi	0	In progress

Figure 13: Package Import is In Progress Page

Because importing can take some time, you are permitted to exit from this screen while the import takes place. The import will continue in the background. You can return to the **Progress** tab of the **Workflow Request** page periodically to check on the progress of the import.

When the import is complete, **Completed** is listed in the **Status** column. You can then click the **Complete Step** button to complete this workflow step.

Package Import is Completed

Package Filename	Adminstudio Package RowId	Status
AcroRead.msi	9	Completed
camtasia.msi	10	Completed
setup.msi	11	Completed

☑ Enter time spent

> Enter the time it took to complete this step in either minutes or hours.
>
> Time spent unit: ○ Hour ◉ Minute
>
> Elapsed time `0`

☐ Send additional email notifications

Complete Step

Figure 14: Package Import is Complete Page

If there is an error during import, an error message will appear in **Status** column and you will be able to click on a link for more information.

Testing Packages and Viewing Test Results

In Workflow Manager 2016, you can create a workflow step that performs AdminStudio testing on packages associated with a workflow request in an earlier workflow step, as described in Selecting Existing AdminStudio Packages and Importing New Packages into AdminStudio. You can also add a subsequent workflow step that displays those test results.

- Running Package Tests

- Viewing Test Results

Running Package Tests

To add a workflow step to a workflow template that will run AdminStudio tests on packages associated with the workflow request, you select a **Step type** of **AdminStudio Integration** and select **Run package tests** from the **AdminStudio Task** list. You also set the **PackageID** parameter to the name of the data element that you have added to import packages or select existing packages.

Figure 15: Specifying a Workflow Step to Test Packages

When this workflow step becomes the active step, testing will automatically be initiated.

Figure 16: Package Testing In Progress

When testing is complete, the word `Completed` will appear in the **Status** column and you can click Complete Step to complete this workflow step.

Figure 17: Package Testing Complete

Viewing Test Results

To add a workflow step to a workflow template that will display AdminStudio test results for packages that have been tested in a previous workflow step (as described in Running Package Tests), you select a **Step type** of **AdminStudio Integration** and select **Get test results** from the **AdminStudio Task** list. You also set the **PackageID** parameter to the name of the data element that you have added to import packages or select existing packages (the same data element you selected in the **AdminStudio Integration > Run package tests** workflow step).

Figure 18: Specifying a Workflow Step to View Test Results

When this workflow step becomes the active step, test results will automatically be displayed. The test results for the package selected in the **Select Package** list are displayed. Make selections from this list to display the test results for all tested packages.

Figure 19: Test Results

After viewing these test results, click **Complete Step** to complete this workflow step.

Distributing Packages

You can create a workflow step that will distribute packages associated with that workflow request to a distribution system that is configured in AdminStudio. To distribute packages using Workflow Manager, you first need to create a data element that identifies the named connection to the distribution system, and then you need to add a workflow step to perform the distribution.

● Setting Distribution System Connections

● Distributing Packages

Setting Distribution System Connections

Before you can distribute packages to a distribution system, you need to create a data element with the data type of **AdminStudio Distribution Connections**. In the **Select Options** field, select which of the named connections to distribution systems defined in AdminStudio that you want to provide as an option in this workflow.

Figure 20: Creating a Distribution Connection Data Element

In addition to creating this data element, you need to also create a data element that prompts the user to specify the name of the group on the distribution system where you want to distribute the packages.

Distributing Packages

To add a workflow step to a workflow template that will distribute packages that have been associated with a workflow request in a previous workflow step (as described in Selecting Existing AdminStudio Packages and Importing New Packages into AdminStudio), you select a **Step type** of **AdminStudio Integration** and select **Publish application** from the **AdminStudio Task** list.

Figure 21: Creating a Workflow Step to Distribute Packages

When defining a distribution workflow step, you need to also set the following parameters:

● **Application ID**—Set this parameter to the name of the data element that you have added to import packages or select existing packages.

● **TargetGroup**—Set this parameter to the name of the data element that you have added to specify the distribution system group name.

● **Connection Name**—Set this parameter to the name of the data element that you have added to specify the distribution system connection.

When this workflow step becomes the active step—after the user has associated packages, selected the distribution system, and specified the distribution system group in a previous workflow step— distribution begins and progress is displayed in the **Status** column. When distribution is complete, the word `Completed` appears in the **Status** column. If there was an error in distribution, there will be a **More Details** link you can click to get more information, and a Refresh button you can click to attempt distribution again.

Figure 22: Distributing Packages

Note • When Workflow Manager uses AdminStudio to publish packages to System Center Configuration Manager, they are published as applications.

Specifying Package Formats and Target Environments

You can use Workflow Manager 2016 to specify data about applications as part of an application rationalization process. For example, after performing testing on an application, you may want to specify the supported target operating system for the package. Or you may want to specify that you want to distribute the package in a different package format than its current format, which may require application virtualization. You may also want to create workflow templates where package format or target environment could be used as a branching condition.

To perform this task, Workflow Manager includes two new data element data types that provide built-in support for prompting the user to specify the package format or target operating system environment of a package.

- Creating an AdminStudio Package Format Data Element

- Creating an AdminStudio Target Environments Data Element

Creating an AdminStudio Package Format Data Element

To create a data element to specify AdminStudio package format, create a data element with a data type of **AdminStudio Package Formats**.

Figure 23: AdminStudio Package Formats Data Element

You also need to click in the **Select Options** field and select the package formats you want to include in the selection list. You can select multiple items from the list.
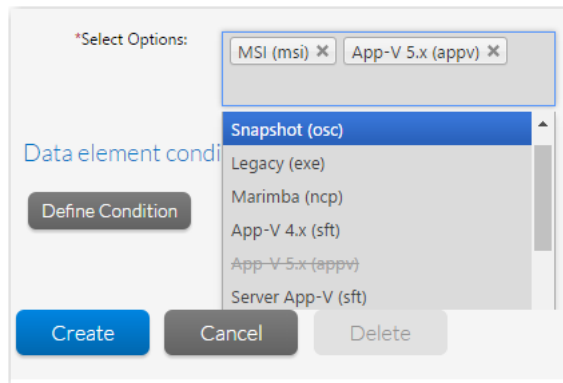
Figure 24: Adding Package Formats to the List

When this data element is displayed in a workflow request, the user will be able make selections from a drop down list.

When this data element is displayed in a workflow request, the user will be able make a selection from a drop down list.

Figure 25: "AdminStudio Package Formats" Data Element

Creating an AdminStudio Target Environments Data Element

To create a data element to specify target environments, create a data element with a data type of **AdminStudio Target Environments**.

Figure 26: AdminStudio Package Formats Data Element

You also need to click in the **Select Options** field and select the target environments you want to include in the selection list. You can select multiple items from the list.

Figure 27: Adding Target Environments to the List

When this data element is displayed in a workflow request, the user will be able make a selection from a drop down list.

Figure 28: "AdminStudio Target Environments" Data Element

Adding Reports to Workflow Requests

In Workflow Manager 2016, you can choose to display in a workflow request both AdminStudio reports specific to the packages associated with the workflow request, and Application Catalog reports that display information on the entire Application Catalog.

- Showing AdminStudio Reports
- Showing Application Catalog Reports

Showing AdminStudio Reports

In Workflow Manager 2016, you can choose to display in a workflow request AdminStudio reports that are specific to the packages associated with the workflow request. These are the same reports that are displayed on the Workflow Manager **Application Catalog Reports** page.

To display AdminStudio reports in a workflow step, first associate packages with a workflow request, as described in Selecting Existing AdminStudio Packages or Importing New Packages into AdminStudio. Then create a workflow step with a step type of **AdminStudio Reports** and select the reports that you want to display from the **Select Report Type** list.

Figure 29: AdminStudio Reports Workflow Step

When an **AdminStudio Reports** workflow step is displayed in a workflow request, information specific to the packages associated with the workflow request is displayed. If multiple report types have been specified in this AdminStudio Reports workflow step, each report type is displayed in a new column.

Figure 30: View Application Catalog Reports Workflow Step in a Workflow Request

Just as you can do in AdminStudio, you can click on an icon to see more detailed results.

Figure 31: AdminStudio Report: Drill Down Report for Selected Package

Showing Application Catalog Reports

In Workflow Manager 2016, you can choose to display in a workflow request Application Catalog reports that display information on the entire Application Catalog. These are the same reports that are displayed on the Workflow Manager **Application Catalog Reports** page.

To display Application Catalog reports in a workflow step, create a workflow step with a step type of **Application Catalog Reports** and select the reports that you want to display from the **Select Report Type** list.

Figure 32: Application Catalog Reports Workflow Step

Note • *If you have added custom .rdlc reports to Workflow Manager, those reports would also be available for selection in the* ***Select Report Type*** *list.*

When an Application Catalog Reports workflow step is displayed in a workflow request, users are prompted to click links to open each of the selected reports.

Figure 33: View Application Catalog Reports Workflow Step in a Workflow Request

When you click on one of the links, the reports opens in a new window.

Figure 34: Application Catalog Report: Overall Package Testing Results

Viewing and Setting AdminStudio Properties

In Workflow Manager 2016, you can choose to display in a workflow request selected properties of packages associated with that request. You can also set package properties in a workflow request.

- Displaying Package Properties in a Workflow Request

- Setting Package Properties in a Workflow Request

Displaying Package Properties in a Workflow Request

You can create a workflow step that displays selected properties for packages associated with a workflow request. The following package properties can be displayed:

- Product Name

- Manufacturer

- Comments

- Product Version

- Product Code

- Product Language

- Flexera Identifier

- Flags

To display package properties in a workflow step, first associate packages with a workflow request, as described in Selecting Existing AdminStudio Packages or Importing New Packages into AdminStudio. Then create a data element with a data type of **Get AdminStudio Property** and select the properties that you want to display from the **Select Options** list.

Figure 35: Get AdminStudio Property Data Element

When a **Get AdminStudio Property** data element is displayed in a workflow request, the properties you selected are listed in table format.

Figure 36: Get AdminStudio Property Data Element Displayed in a Workflow Request

Setting Package Properties in a Workflow Request

You can create a workflow step that enables users to set selected properties for packages associated with a workflow request. For all packages associated with the workflow request, you can set a package property to the same specified value. The following package properties, associated with publishing a package to App Portal, can be set:

- Categories
- Template
- Keywords
- Long Description
- Brief Description
- Manufacturer

To set a package property in a workflow step, first associate packages with a workflow request, as described in Selecting Existing AdminStudio Packages or Importing New Packages into AdminStudio. Then create a data element with a data type of **Set AdminStudio Property**, select the property that you want to set from the **Property name** list, and enter the **Property Value** that you want to set.

Data Element Details

*Description:	Category
*Required:	● Yes ○ No
*Sort order:	10
Help text:	
*Data type:	Set AdminStudio Property ▼
Property Name:	Categories ▼
Property Value:	Software

Data element condition

[Define Condition]

[Update] [Cancel] [Delete]

Figure 37: Set AdminStudio Property Data Element / Categories Property

For example, if you want to set the App Portal category of all of the packages associated to a Workflow Request to **Utilities**, you would select **Categories** from the **Property Name** list and enter **Utilities** in the **Property Value** list.

When a **Set AdminStudio Property** data element is displayed in a workflow request, the status of the property update is listed.

Figure 38: Set AdminStudio Property Data Element Displayed in a Workflow Request

Global Automation Templates Updated to Use New AdminStudio Integration Features

📋

*Note • If you are upgrading from a previous release, your existing **Application Readiness Process Template** and **Mobile Application Request Template** will remain unchanged, and the new templates that are added will have a **2016** suffix, such as **Application Readiness Process Template 2016**.*

To help you learn about these new AdminStudio integration features and to display how these features work together, the following existing global templates were updated to use these new features

● Application Readiness Process Template

● Mobile Application Request Template

Both templates provide an end-to-end workflow that can be used to upload a package and then deploy it via distribution points that are set up in AdminStudio.

Application Readiness Process Template

This template, which implements the new AdminStudio integration features throughout, includes phases and steps that take you through application readiness standard practices for desktop applications:

- Importing packages to the Application Catalog
- Gather application rationalization data
- Test and review test results
- Perform application rationalization planning
- Repackage and test
- Deploy

Mobile Application Request Template

This template, which implements the new AdminStudio integration features throughout, includes suggested phases and steps to prepare a mobile app for deployment.

- Importing mobile packages to the Application Catalog
- Gather application rationalization data
- Test and review test results
- Perform application rationalization planning
- Deploy
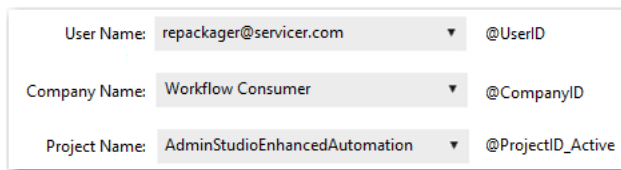
Reporting Enhancements

Workflow Manager 2016 includes several enhancements to its reporting features.

- Enhancements to Custom Report via Stored Procedure
- Ability to Modify Dashboard Queries

Enhancements to Custom Report via Stored Procedure

In Workflow Manager 2016, you can specify known predefined parameters in a stored procedure. When the report is displayed, it will include drop down lists that users can use to filter the data displayed in the custom report.

Figure 39: Predefined Parameters Displayed in Custom Stored Procedure Report

Workflow Manager ships with a default stored procedure named `usp_getreadonlyworkflows`. In this stored procedure, the following predefined parameters are supported:

Parameters	Description
`@ApplicationID`	List of all the workflow request names.
`@ApplicationID_Completed`	List of all the workflow request names which are already completed.
`@ApplicationID_InProgress`	List of all the workflow request names which are in progress.
`@CompanyID`	For a consumer company, this will default to the company ID of the user's company. For an administrator company, this will default to the company ID of the user's company, but will also include the company IDs of corresponding client companies as well.
`@ProjectID`	List of all projects.
`@ProjectID_Active`	List of all active projects.
`@TemplateID`	List of all templates.
`@UserID`	List of all users based on CompanyID.
`@WorkflowStatus`	Values from `[AMS_ApplicationStatus]` table status.

You can also edit an XML file named `StoredProcParams.xml` in the Workflow Manager installation directory to add additional parameters.

```xml
<?xml version="1.0" encoding="UTF-8"?>
- <StoredProcParams>
      <!--can provide list of all template names no global templates-->
  - <Parameter>
      <Key>TemplateID</Key>
      <label>Template Name</label>
    - <Value>
        cdata
        <![CDATA[SELECT TEMPLATEID AS VALUE, TEMPLATENAME AS TEXT FROM AMS_TEMPLATES WHERE
        sCOMPANYID IN ( SELECT DISTINCT sc.CompanyID FROM AMS_Company sc WITH (NOLOCK),
        AMS_ServiceCompanyJoin scj WITH (NOLOCK) WHERE sc.CompanyID = '[CompanyId]' OR
        (sc.CompanyID = scj.CompanyID AND scj.ServiceCompanyID = '[CompanyId]'))]]>
      </Value>
  </Parameter>
      <!--can provide list of all project names-->
  - <Parameter>
      <Key>ProjectID</Key>
      <label>Project Name</label>
    - <Value>
        cdata
        <![CDATA[SELECT CONTRACTID AS VALUE, CONTRACTNAME AS TEXT FROM AMS_Contracts WHERE
        COMPANYID IN ( SELECT DISTINCT sc.CompanyID FROM AMS_Company sc WITH (NOLOCK),
        AMS_ServiceCompanyJoin scj WITH (NOLOCK) WHERE sc.CompanyID = '[CompanyId]' OR
        (sc.CompanyID = scj.CompanyID AND scj.ServiceCompanyID = '[CompanyId]')) ]]>
      </Value>
```

Figure 40: StoredProcParams.xml File

This file installed in the following location:

`C:\AdminStudioWebComponents_2016\wwwroot\App_Data`

In the `StoredProcParams.xml` file, the `<Value>` element is a select statement that will be used to populate the drop down list for that parameter.

Ability to Modify Dashboard Queries

In Workflow Manager 2016, you can control the projects that are listed in the **Project** list on the **Dashboard** page.
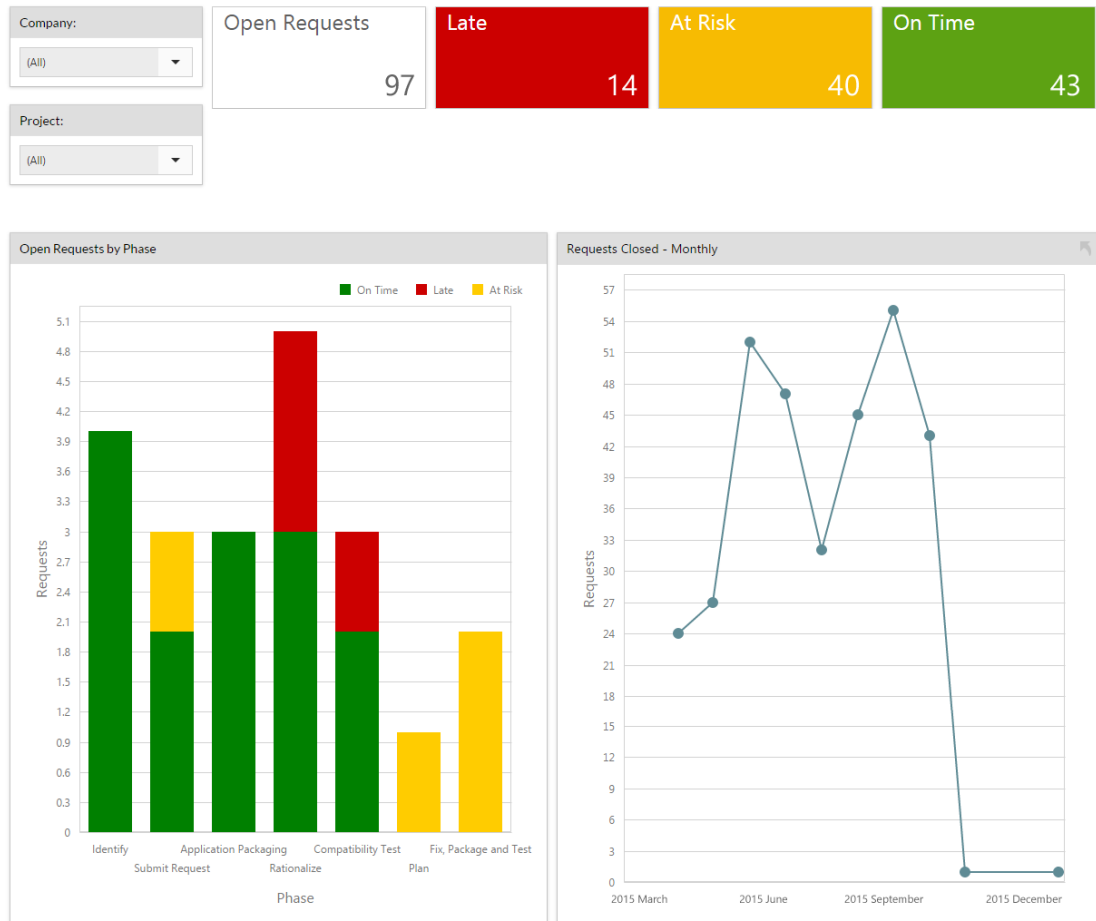
Figure 41: Workflow Manager Dashboard Page

You can control the projects that are listed, and also make other modifications to the data displayed on the Dashboard page, by editing the queries in the `XMLQuery.xml` file:

`wwwroot\App_Data\XMLQuery.xml`

In this XML file, nodes that have an ID that begins with `Dashboard_` contain specific SQL queries that Workflow Manager uses to create the Dashboard, such as:

`<Query id="DashBoard_GetCompanyProjectAdmin">`

Important • You can modify the WHERE conditions of the SQL queries but, do not change the name or number of columns returned by the query.

New "Read-Only" Workflow Requests Report

In Workflow Manager 2016, a new out-of-the-box report has been added that lists all of the workflow requests that are in "read-only" status due to a stopped SLA clock or having an open critical issue.

You can view this report by selecting C**reate Custom Stored Procedure Report** from the **Reports** menu, and then selecting the `usp_GetReadOnlyWorkflows` from the **Stored procedure** list.

Note • This enhancement was tracked in issue IOJ-1752931.

Dashboard Reports No Longer Include Statistics from Inactive Workflow Requests

In Workflow Manager 2016, the Dashboard reports will no longer include statistics from inactive workflow requests.

Note • This enhancement was tracked as issue OJ-1756190.

Workflow Manager Configuration Enhancements

Workflow Manager 2016 includes the following new features to make it easier to configure Workflow Manager.

- Ability to Configure Settings on New Company Preferences Page

- Control Over Installation Location of Workflow Manager

- Customizing Shared Folder Path to Store Uploaded Files

- Web Server and SMTP Server Can Be Set During Installation Using the Configuration Wizard

Ability to Configure Settings on New Company Preferences Page

In previous releases, you performed most Workflow Manager configuration tasks by editing the Workflow Manager configuration file (`web.config`), which is located in the following directory:

`C:\AdminStudioWebComponents_2016\wwwroot`

Editing this file requires administrator permissions and required access to the machine where Workflow Manager is installed.

In Workflow Manager 2016, a new **Company Preferences** page has been added, where you can easily modify some of Workflow Manager's configuration settings on a per-company basis. You open this page by selecting **Company Preferences** on the **Settings** menu and then clicking on a company name.

Company Preferences

Edit Company Preference settings and click Save.

Company Name for Emails :	Workflow Administrator
Email Address :	noreply@MyCompany.com
Send Email To Auto Imported Users :	☐
Send Email To Requester :	☐
Include User Name In Email Subject :	☐
Product Name :	Workflow Manager
Send Email As BCC :	☐
Send One Email To All Users :	☑
Send Email To Users With Edit Privileges :	☐
AdminStudio Url :	http://localhost:8086/
AdminStudio Import Base Directory :	C:\AdminStudioWebComponents_2016\SHAF
AdminStudio Import Formats :	msi, exe, ipa, apk, appx, xpf, sft, appv, profile,
Release AdminStudio Receipt :	☑

Save   Cancel

Figure 42: Company Preferences Page

The **Company Preferences** page includes the following properties.

Property	Description
Company Name for Emails	Enter the company name that is used in the body of Workflow Manager emails. This is usually set to the name of the primary administrator company.
Email Address	Enter the Workflow Manager system email address. All emails sent by Workflow Manager will be from this email address.
Send Email To Auto Imported Users	Select this option to instruct Workflow Manager to end email notifications to all automatically imported members of a directory service group that was set to receive email notifications.
Send Email To Requester	Select this option to send a confirmation email to the workflow request submitter once the request has been submitted successfully.
Include User Name in Email Subject	Select this option to include the assigned user's name in the email subject line of a notification email.
Product Name	To customize the name of this application, enter a value other than Workflow Manager.
Send Email As BCC	Select this option to prevent email recipients from seeing the email addresses of other users that are receiving the same email.
Send One Email To All Users	Select this option to instruct Workflow Manager to send one email notification to all specified users. If this option is not selected, individual emails will be sent to all specified users. In other words, instead of sending out one email to 25 people, Workflow Manager will send out 25 emails to 25 people.
Send Email To Users With Edit Privileges	By default, if there are no email notifications defined on any workflow phase or step, Workflow Manager will not send any email notifications upon step completion. However, if you select this option, Workflow Manager will send email notifications to all assigned users who have edit permission on the next workflow step (even though no email notifications are defined).
AdminStudio Url	If AdminStudio is configured with the Flexera Service Gateway, then during Workflow Manager installation, the AdminStudio URL will be entered in this field.

Property	Description
AdminStudio Import Base Directory	When importing packages into the AdminStudio Application Catalog as part of a workflow step, the packages to be imported need to copied to a subdirectory of this directory. By default, the value of this property is: `C:\AdminStudioWebComponents_2016\SHAREPATH\UNCPath` This path is initially set using the Configuration Wizard immediately after Workflow Manager installation. As soon as a workflow request is created, Workflow Manager automatically creates a subdirectory inside this base directory for that request using the following naming convention: *WorkflowRequestName*`_WFnn` Examples are `Perforce_WF19` or `Lightroom_WF10`.
AdminStudio Import Formats	To specify the import formats you want to Workflow Manager to support, edit the list of file extensions in this field. File extensions are listed without the preceding period and are separated by commas. Workflow Manager supports importing most of the deployment types that are supported by AdminStudio: ● Microsoft Windows Installer package (.msi) ● Installation package (.exe) ● VMware ThinApp virtual package (.exe) ● Apple iOS mobile application (.ipa) ● Google Android mobile application (.apk) ● Microsoft Windows Store application (.appx) ● Symantec Workspace virtual package (.xpf) ● Microsoft App-V 4.x virtual package (.sft) ● Microsoft App-V 5.x virtual package (.appv) ● Citrix XenApp virtual package (.profile) ● Mac OS X disk image (.dmg) ● Mac OS X installer package (.pkg)

Property	Description
Release AdminStudio Receipt	When Workflow Manager, when performing an AdminStudio Integration workflow step, calls the AdminStudio API, the AdminStudio API returns a Receipt ID that helps keep track of transactions.
	• **If this option is selected**, then Workflow Manager calls another API to release these Receipt IDs.
	• **If this option is not selected** and Receipt IDs are not released, then they keep adding to database size. Receipt IDs, if not released, can help keep a history of transactions.
	Note • It is recommended that this option be selected.

Control Over Installation Location of Workflow Manager

In Workflow Manager 2016, a new panel was added to the Workflow Manager installer which gives you the ability to set the destination location of the Workflow Manager application.
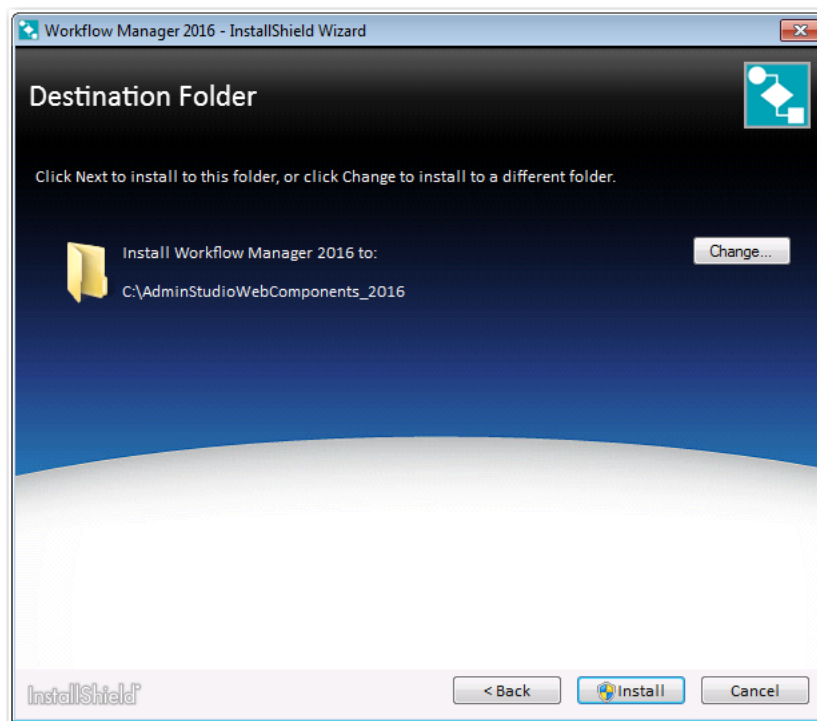
Figure 43: New Destination Folder Panel of InstallShield Wizard

Note • It is recommended that you do not install Workflow Manager in the C:\Program Files or C:\Program Files (x86) directory.

Customizing Shared Folder Path to Store Uploaded Files

In previous released, the shared folder path to store uploaded files followed this format, and the user had no way to customize it

```
[File Share]\[Servicer Company]\[Customer Company]\[App Short Name]__[App_GUID]
```

In Workflow Manager 2016, you can now configure this path by editing the following setting in the `web.config` file:

```
<add key="UploadFolderStructure" value="" />
```

You can configure this path by providing the value of the `UploadFolderStructure` property in `web.config`. When specifying it, you can use a combination of the following elements:

```
[ServicerCo]
[ConsumerCo]
[ProjectName]
[ProjectId]
[WFId]
[WFName]
```

For example:

```
<add key="UploadFolderStructure" value="[ProjectName][AppName]_[ARNumber]" />
```

Web Server and SMTP Server Can Be Set During Installation Using the Configuration Wizard

The **Configuration Settings: Administrative** panel of the AdminStudio Configuration Wizard, includes two new fields: **SMTP Server Address** and **Web Server Address**.
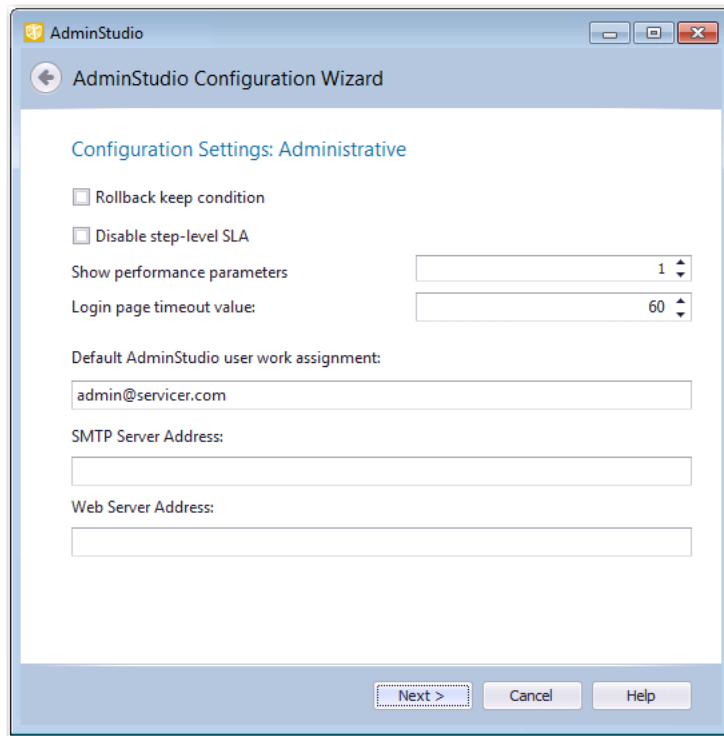
Figure 44: Configuration Settings: Administrative Panel of AdminStudio Configuration Wizard

In the **SMTP Server Address** field, enter the address of your email server.

In the **Web Server Address** field, you can modify the Workflow Manager website IP address. By default, it is `http://localhost/`.

Workflow Manager Usability Enhancements

Workflow Manager 2016 includes the following usability enhancements:

- Ability to Identify Assigned User in Email Notifications by Setting Preferred Role

- Ability to Add Custom Links to Website

- Workflow Requests Assigned to Me List Only Lists Workflow Requests User Has Edit Permission On

- Ability to Turn Off Auto Filtering of Workflow Manager Lists

- Ability to Upload Multiple Files at a Time

- Ability to Collect Data on Custom Step

- Workflow Number Column Has Been Added to View Assignments by Account Page

- Ability to View All Pages of Data Entry Workflow Step Before Answering All "Required" Questions

- Ability to Limit Editing of Workflow Steps to Assigned Users

- Support for Longer Workflow Request Names

Ability to Identify Assigned User in Email Notifications by Setting Preferred Role

Email notification permission is set at the workflow template level, and multiple roles can be assigned email notification permission on the same workflow phase or step.

By default, notification emails are sent to users assigned to roles that have email notification permission on a workflow step, even those assigned to roles that do not have edit permission on that workflow step. Previously, when a notification email was sent out, all email recipients were listed in the **To** field of the email, and there was no indication of which user is assigned to the role that has edit permissions on that specific workflow step.

In Workflow Manager 2016, a new option named **Select Preferred Role** has been added to the **Notifications** subtab of the **Workflow Step Details** view. If a preferred role is selected, when a notification email is sent out, the email address of the user assigned to the preferred role for the workflow step is now listed in the **To** field, while all other email recipients are listed in the **CC** field.

Figure 45: Select Preferred Role for Email Notification

Also, a new notification variable has been added, **[AssignedUser]**, which you can insert into a notification email's subject line or body to further highlight the assigned user.

Note • This enhancement was tracked in issue IOJ-1742779.

Ability to Add Custom Links to Website

In Workflow Manager 2016, you can now add custom links to the Workflow Manager user interface, which are accessible to users from any Workflow Manager page. To view these custom links, click the References icon in the navigation menu.
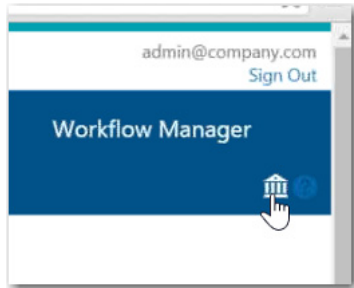
Figure 46: References Icon

When you click this link, your custom links appear in a slide-out **References** panel.
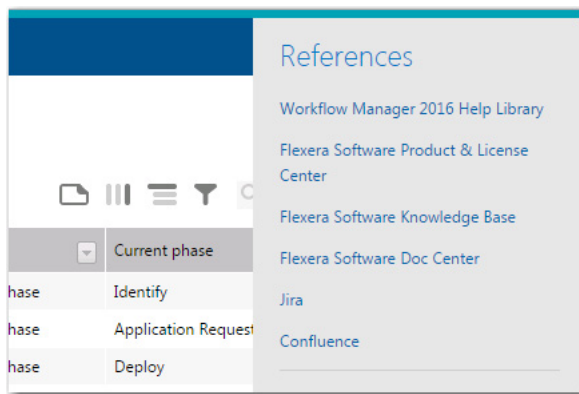
Figure 47: References Panel

To add custom links to the **References** panel, perform the following steps.
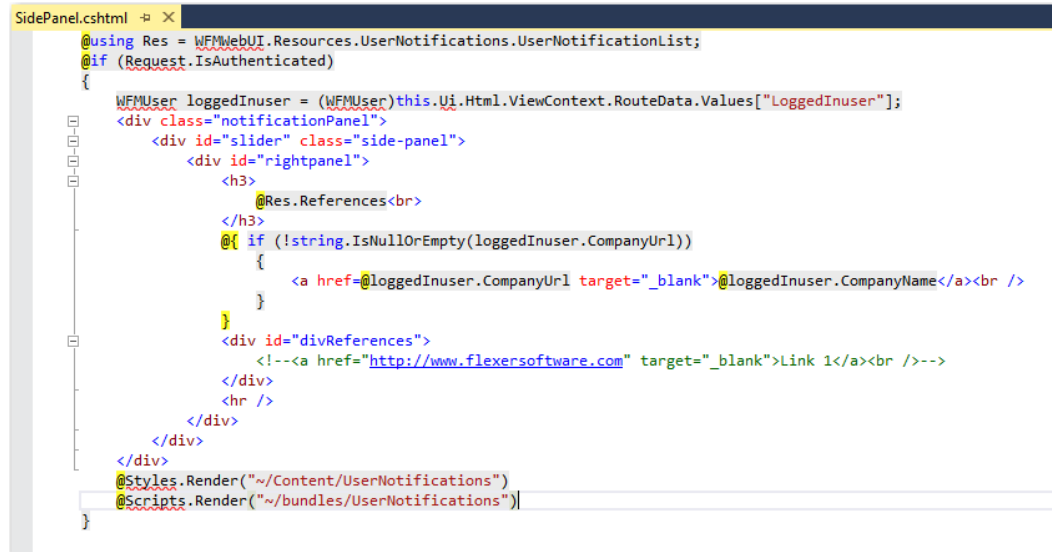
Task | ***To add links to the References panel:***

1. In the Workflow Manager installation directory, open the following file in a text editor:

   C:\AdminStudioWebComponents_2016\wwwroot\Views\Shared\SidePanel.cshtml

```
SidePanel.cshtml  ⌐ ×
    @using Res = WFMWebUI.Resources.UserNotifications.UserNotificationList;
    @if (Request.IsAuthenticated)
    {
        WFMUser loggedInuser = (WFMUser)this.Ui.Html.ViewContext.RouteData.Values["LoggedInuser"];
        <div class="notificationPanel">
            <div id="slider" class="side-panel">
                <div id="rightpanel">
                    <h3>
                        @Res.References<br>
                    </h3>
                    @{ if (!string.IsNullOrEmpty(loggedInuser.CompanyUrl))
                        {
                            <a href=@loggedInuser.CompanyUrl target="_blank">@loggedInuser.CompanyName</a><br />
                        }
                    }
                    <div id="divReferences">
                        <!--<a href="http://www.flexersoftware.com" target="_blank">Link 1</a><br />-->
                    </div>
                    <hr />
                </div>
            </div>
        </div>
        @Styles.Render("~/Content/UserNotifications")
        @Scripts.Render("~/bundles/UserNotifications")
    }
```

2. Locate the `<div id="divReferences">` section.

3. Enter URLs using the following format:

   ```
   <p><a href="http://www.site1.com" target="_blank">Link to Site 1</a></p>
   <p><a href="http://www.site2.com" target="_blank">Link to Site 2</a></p>
   ```

4. Save the file (which will require administrator permission).

5. Relaunch Workflow Manager and click the **References** link in the navigation menu. The new links appear in a slide-out **References** panel.
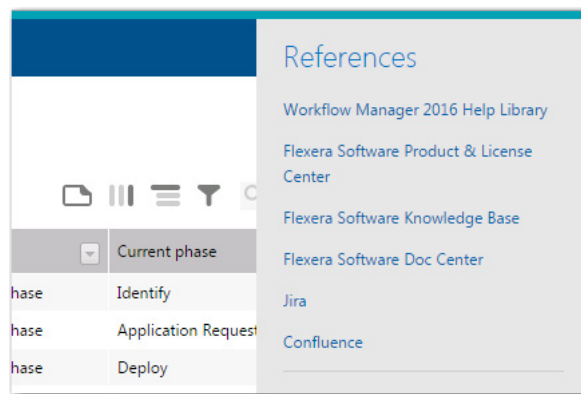
Workflow Requests Assigned to Me List Only Lists Workflow Requests User Has Edit Permission On

Previously, the **Workflow Requests Assigned to Me** page listed all workflow requests that a user was assigned to, even if the current workflow step of that workflow request was one that the user did not have edit permissions on.

In Workflow Manager 2016, a users' **Workflow Requests Assigned to Me** page only lists workflow requests if that user has edit permission on the current workflow step.

Ability to Turn Off Auto Filtering of Workflow Manager Lists

In previous releases, when using the filter controls to filter any of the large lists in Workflow Manager (such as on the **All Workflow Requests** page), the filter started to auto filter rows as soon as you started typing the first few characters in the filter box (instead of when you pressed Enter). With large lists, this resulted in delays.
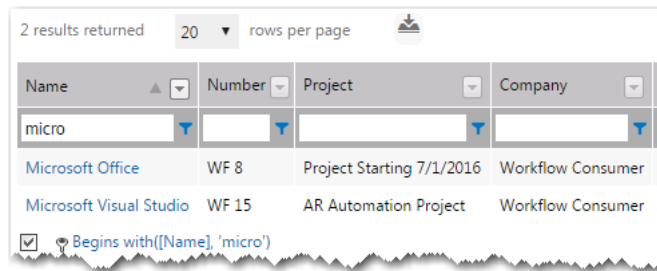
Figure 48: Filtering a Large List

In Workflow Manager 2016, a new settings has been added to the web.config file to control filtering behavior.

`<add key="GridViewFilterRowMode" value="1" />`

Set the `GridViewFilterRowMode` setting to one of the following values:

- **1**—Perform data filtering when you click Enter.

- **0**—Perform data filtering automatically soon after you enter a few characters in the filter box.

Ability to Upload Multiple Files at a Time

In Workflow Manager 2016, you now have the ability to upload multiple files at a time. The new File Upload dialog box provides controls that enable you to select and upload multiple files at a time.
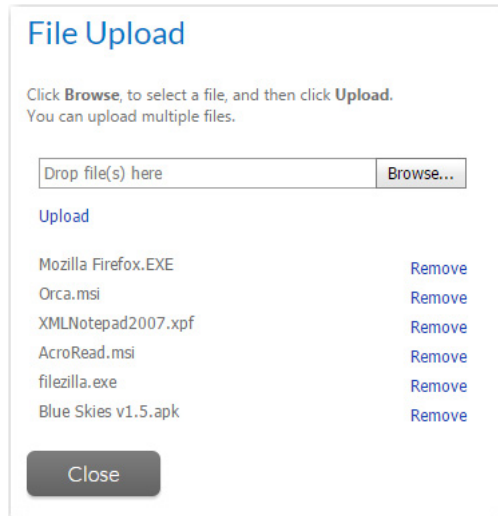
Figure 49: File Upload Dialog Box With Multiple File Selection
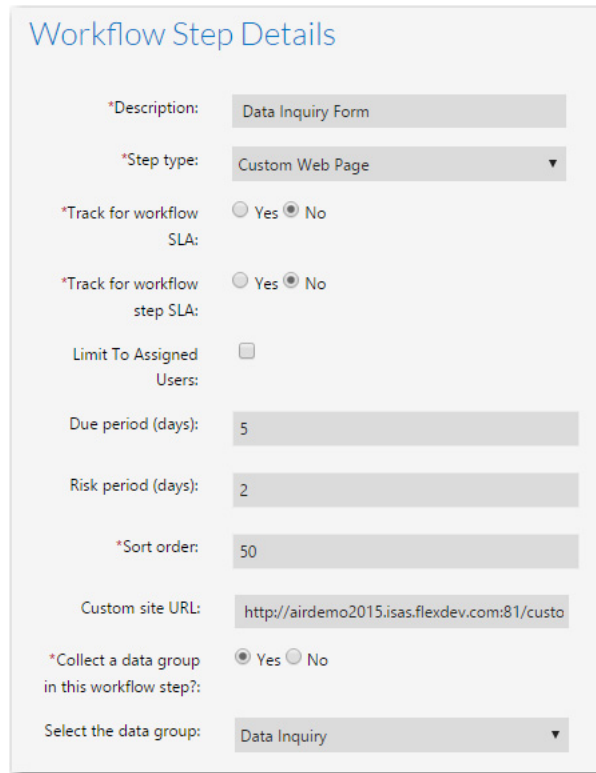
You can click the **Browse** button and select files multiple times. Each time you add a file, it is added to the list. When you are ready to upload all of the listed files, click the **Upload** button.

Note • This enhancement was tracked as issue IOJ-1752833.

Ability to Collect Data on Custom Step

In Workflow Manager 2016, when creating a workflow step with a step type of **Custom Web Page** or **Script Execution**, you can now choose to collect a data group. In previous releases, this option was not available.
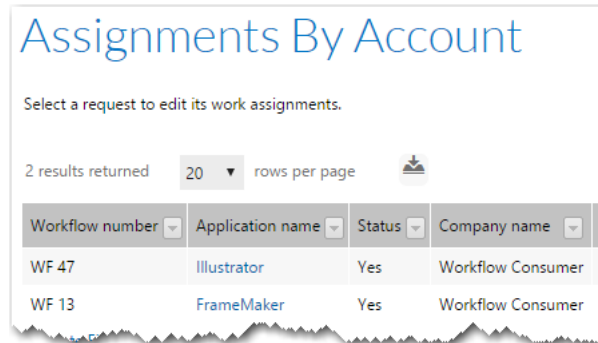
Figure 50: Collecting a Data Group In a Custom Web Page Workflow Step

Note • *This enhancement was tracked as issue IOJ-1757673.*

Workflow Number Column Has Been Added to View Assignments by Account Page

A new **Workflow number** column has been added to the list on the **Assignments By Account** page.

Figure 51: Workflow Number Column on Assignments By Account Page
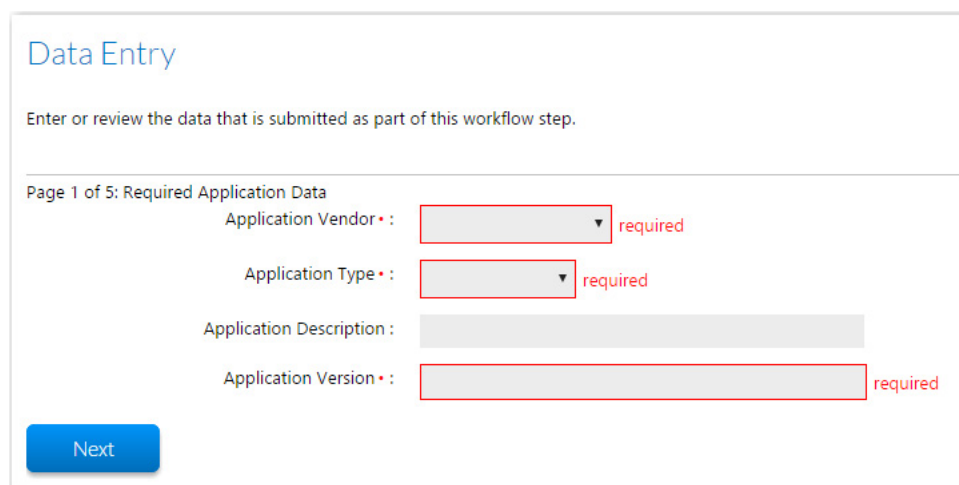
Note • This enhancement was tracked as issue IOJ-1765297.

Ability to View All Pages of Data Entry Workflow Step Before Answering All "Required" Questions

When collecting data in the first workflow step or in subsequent workflow steps, sometimes the user is required to answer questions on multiple pages (each defined in a separate data group) before submitting the data to complete the step.

In previous releases, you had to answer all questions designated as "required" on a data entry page before being able to view the questions on subsequent pages. If you clicked **Next** with unanswered "required" questions, those required questions would be highlighted and you would be unable to proceed to the next page.

Figure 52: Highlighting of Unanswered "Required" Questions

With this release, you can now click **Next** and view all of the pages in a data entry workflow step even if required questions on one or more pages have not been answered.

When you click **Submit** on the last data entry page, if there are any unanswered "required" questions, an error message will appear, listing the questions that need to be answered. You can then click the page name to return to that page and answer those questions.

Figure 53: Error Message Listing Unanswered "Required" Questions on Submit Page

"Skip Required Entries for Now" Option

Regarding postponing the answering of required questions, you have two options:

- **User is required to select the "Skip required entries for now" option**—You can configure Workflow Manager so that the user is required to select the **Skip required entries for now** option in order to be able to proceed to the next page when required questions have not been answered.

Figure 54: New "Skip required entries for now" option

- **Automatically enable ability to skip required entries**—You can configure Workflow Manager so that the **Skip required entries for now** option is not displayed, and the user is automatically permitted to proceed to the next page of questions even though "required" questions remain unanswered.

The SkipRequiredElements setting in the appSettings section of the web.config file determines whether or not the **Skip required entries for now** option is displayed:

```
<add key="SkipRequiredElements" value="0" />
```

The SkipRequiredElements setting has two possible values:

- **User required to select an option to proceed**—If the SkipRequiredElements setting is set to 0, the user will be required to select the **Skip required entries for now** option on each data entry screen that contains a required field in order to proceed to the next page of questions even though "required" questions remain unanswered. (Default)

- **User not required to select an option to proceed**—If the SkipRequiredElements setting is set to 1, the **Skip required entries for now** option will not be displayed on each data entry screen that contains a required field, and the user is automatically permitted to proceed to the next page of questions even though "required" questions remain unanswered.

Ability to Limit Editing of Workflow Steps to Assigned Users

Previously, when you assigned Edit permission to a role for a workflow step, every user belonging to that role was permitted to complete that step, even if they were not specifically assigned to that role for that workflow request.

In this release, a new option named **Limit Editing to Assigned Users** was added to the **Workflow Step Details** view. If this option is selected for a workflow step, only users who are assigned to the workflow request are permitted to edit that step, instead of permitting all users who belong to the role with Edit permission.

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Note • This enhancement was tracked in issue IOJ-1741196.

Support for Longer Workflow Request Names

In this release, you are now permitted to enter a maximum of 80 characters in the **Workflow request name** field on the **Submit Workflow Request** page. Previously, only 27 characters were permitted.

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Note • This enhancement was tracked in issue IOJ-1741900.

Resolved Issues

This section lists the customer issues that were resolved in Workflow Manager 2016.

Issue Number	Summary
IOJ-1525796	The "required" attribute does not work as expected for any upload type (Document Upload, Application Upload, etc.) data element when it is not collected during the initial submission.
IOJ-1662141	Workflow Manager is not getting registered with Flexera Service Gateway.
IOJ-1700592	Request to send an notification email to the workflow request submitter after the request is successfully submitted.
IOJ-1722003	IPlugin is unable to import a package by calling Invoke-ASImportPackage command.
IOJ-1722208	A dynamic pick list only returns the first column.
IOJ-1727431	Test Workflow Manager / AdminStudio Enterprise Server functionality when running under HTTPS.
IOJ-1729384	The `SetWorkAssignments` API fails when trying to assign work to a user who is member of an imported Active Directory group.
IOJ-1733152	File Upload dialog box does not display a progress bar.
IOJ-1734262	The Process Assistants view in AdminStudio does not show users from all domains, when the `AdminStudioADGroup` setting in web.config uses an AD group with users from different domains.
IOJ-1738155	Notification variables are left unresolved in the email notifications going out of Workflow Manager.
IOJ-1739446	Duplicate email sent when `AutoAcceptSubmissions` set to 1 and using Internet Explorer.
IOJ-1739562	Auto work assignment does not work with FlexNet Manager Platform Compliance API Service Connection.
IOJ-1740100	The AdminStudio workflow owner role is missing in Workflow Manager 2015.
IOJ-1740329	Allow users to change installation location of Workflow Manager package.
IOJ-1741093	Conditional elements do not work for elements in the same workflow step.
IOJ-1741444	The **Workflow Requests Assigned to Me** grid should only show workflows which are currently on a phase/step for which the user/role has edit permissions.

Issue Number	Summary
IOJ-1741886	The **Admin Distinguished Name** field on the **Add/Edit Directory Service Connection** page has been changed to **Admin Name (Domain\User)** to more accurately describe the required value of the field.
IOJ-1743159	When using Internet Explorer, if you changed the **Data type** of a data element on the **Data Element Details** view, clicked **Update**, and then exited and returned to that view, the original value for the **Data type** would be displayed instead of the updated value. You were required to restart the browser in order for the updated **Data type** value to be displayed.
IOJ-1743159	Data type on data element not updated properly in Internet Explorer.
IOJ-1743343	Windows authentication is only needed for Workflow Manager-App Portal integration.
IOJ-1743761	After you connect to the AdminStudio Enterprise Server database from AdminStudio, you are prompted to enter the login credentials again when you attempt to open the Security Console from AdminStudio, even though you are already logged in. Instead, the Home page should be displayed.
IOJ-1744641	When using Internet Explorer, directory service attributes are not refreshed when you select a different directory service on the **Data Element Details** view for a data element with a **Data type** of **Directory Service**.
IOJ-1744735	If you attempt to delete a project by clicking the **Delete** button on the **Project Details** page, Workflow Manager sporadically displays the **Login** page and does not delete the project.
IOJ-1744759	After you import the Domain Users Active Directory group into Workflow Manager, you are unable to create a new project because you are unable to search and select the consumer and administrator contact.
IOJ-1745328	The grid filter used for web service data element persisted for another web service data element also.
IOJ-1745471	The workflow link sent in the Workflow Manager email notifications throws an error on some machines.
IOJ-1745941	Provide ability to turn off auto filtering in Workflow Manager grids.
IOJ-1748035	You are unable to use the **Enter Search String** search box to search for a record when specifying a **Web Service Call** data element; the search text box is missing.
IOJ-1748683	Error is generated when attempting to copy a workflow template.
IOJ-1748684	Error is generated when attempting to edit a workflow template that is in use if at least one of the workflow requests that uses that template has been completed.

Issue Number	Summary
IOJ-1748711	When you perform a rollback, notification emails are not sent to email addresses listed in the **Additional E-mail Recipients (Optional)** field.
IOJ-1748716	When assigning work to a workflow request that has a workflow phase with a **Phase type** of **AdminStudio Workflow**, the search results are listed even after you have assigned a user to the AdminStudio Workflow Owner role.
IOJ-1749087	Cannot utilize single sign-on through portal site.
IOJ-1749090	For the iPlugin functionality to work properly, the AMS System user needs to be in the IIS_IUSRS group.
IOJ-1749093	Upgrading to Workflow Manager 2015 removes any custom email templates.
IOJ-1751516	The Workflow Manager session terminates and shows a login screen.
IOJ-1752165	What tables should be checked for sensitive information.
IOJ-1752178	Config.exe network share issue when Workflow Manager is not installed to default location.
IOJ-1752180	Setting in web.config was preventing the integration between Workflow Manager and AdminStudio from progressing a workflow through its steps from the AdminStudio Process Assistant.
IOJ-1752408	Is the SLA time for individual steps stored in the database?
IOJ-1752832	How do you Associate WFM workflow with AS package?
IOJ-1752833	Request ability to upload multiple files at once instead of one-at-time.
IOJ-1752931	Request for a report for workflow requests that are in read-only status.
IOJ-1753129	When copying a workflow template with the **Copy role permissions** and **Copy notifications** options selected, the copy has missing phases.
IOJ-1753937	Problem getting iPlugin to work correctly.
IOJ-1754240	Having multiple single-selection data elements in a single data group prevents data element condition from working properly.
IOJ-1754390	Single selection and radio button data types do not get sorted when specified that they be collected "later in the workflow".
IOJ-1754395	The "required" restriction on data fields is not working for "Later in the workflow" data groups.
IOJ-1754409	My Page URL no longer displays page on dashboard.

Issue Number	Summary
IOJ-1754412	Request to change the DB Driven data type to save multiple values on a new line.
IOJ-1754413	Request ability to customize or disable the dashboard for users.
IOJ-1754509	Dates appear in U.S. format when browser and system are set otherwise.
IOJ-1754605	Request to make the "required" restriction on data elements be checked only upon submit.
IOJ-1754608	Hyperlink does not work in the help field of the templates.
IOJ-1754611	Directory service data elements collected in later data groups are not resolved automatically
IOJ-1754698	Need resolution to occurrence of sporadic WFM 500 errors.
IOJ-1754821	Unable to use the **Work Assignment** feature to assign work to Active Directory users who were part of an Active Directory group. If the user already existed in the database, then the work assignment was successful. If the user was not previously in the database, but was part of the Active Directory group, then the work assignment would not be successful.
IOJ-1754929	Latest version of Internet Explorer does not display workflow step name properly.
IOJ-1754935	Custom aspx page not working after upgrade to Workflow Manager 2015.
IOJ-1755066	Multi-select data element selections do not show up in the user interface after the values are submitted.
IOJ-1755067	Multi-select data element selections get cleared up when a single-select data element with conditions exists in the same data group.
IOJ-1755074	AMSSMTPServer not set in web.config on install.
IOJ-1755167	Dynamic pick list column value to submit shows wrong headers.
IOJ-1755178	During workflow request submission, users were able to successfully submit data even though they had not answered a "required" data element that prompts a file upload.
IOJ-1755196	Data groups with conditional data elements collected later in the workflow refresh the whole page, unlike data groups with conditional data elements collected in the initial workflow step, which only refresh the frame. The whole page refresh caused problems and confusion.
IOJ-1755952	Blank pages displayed on data entry view of workflow request.

Issue Number	Summary
IOJ-1756175	The statistics text that shows up in the Account Details view shows where the user is referenced in the database. The text says "workflow requests" instead of "workflow request details". This can mislead a user to think that they may have many more workflow requests in the system than they actually have.
IOJ-1756180	Unable to use the left arrow to move to phase 1 from phase 2 on the Workflow Progress screen.
IOJ-1756184	Templates tied to projects can be deleted.
IOJ-1756190	Request to not show inactive workflows in the dashboard.
IOJ-1756254	Workflow Manager Progress tab shows up blank for the initial phase, even when the permissions are configured for the template.
IOJ-1756592	No vertical scroll bar for the Work Assignment step popup page in Internet Explorer 11.
IOJ-1756992	Request to skip required element on the final submit page when trying to view the previous data groups.
IOJ-1757549	The Attribute Name drop down does not get refreshed when you change the Directory Service Name on the Add Directory Service Attributes page.
IOJ-1757551	Directory service attributes cause Workflow Manager to hang.
IOJ-1757673	Display controls to associate data group with custom web page step.
IOJ-1757968	Config utility resets `App Pool Identity` to `AppPoolIdentity`.
IOJ-1757969	Config utility displays the Workflow Manager file share incorrectly.
IOJ-1758021	Slow performance on trying to add applications when creating a new exclusion list.
IOJ-1758374	Workflow creation time incorrect.
IOJ-1758655	Preview button for Instruction popup shows only default `.htm` content.
IOJ-1758686	Request to add information about e-mail address delimiter in step completion dialog box.
IOJ-1759909	Request Detail report not displaying expected workflows if they have a null `EndDate`.
IOJ-1760376	Assignment Details screen no longer searches `displayName` field.
IOJ-1761388	In the template workflow step notification, if a role/user is selected in the Select Preferred Role field, the rest of the listed roles should be sent in the CC field of the notification email. However, the CC field is empty in the email.

Issue Number	Summary
IOJ-1761729	Initial phase's "initial step completion" email throws an exception in the log, and the email is not sent.
IOJ-1762478	Unable to progress workflow.
IOJ-1762889	Unable to assign member of Domain Users to a role.
IOJ-1765297	Add Workflow Number column to View Assignments by Account page.
IOJ-1766913	Documentation to increase file upload size does not provide correct details.

System Requirements

This section lists the system requirements for Workflow Manager.

- Workflow Manager Web Server

- Workflow Manager / AdminStudio Database Server

- File Share Server

- Workflow Manager End User Computers

- Portal Web Server for Intranet Clients

- Portal Web Server for Internet Clients

- Workflow Manager System Account Requirements

Workflow Manager Web Server

The following table lists the system requirements for the Web server that hosts the Workflow Manager Data Web service and the actual Workflow Manager Web site.

Item	Description
Processor	32-bit or 64-bit processor at 2 GHz or greater.
	Note • Workflow Manager runs in 32-bit mode on a 64-bit OS.
RAM	4 GB or greater (8 GB preferred)
Hard Disk Space	100 GB or greater
Operating System	Windows Server 2008 R2 or later / English base language (Windows Server 2012 preferred)
IIS	IIS 7.0 or later
.NET Framework	.NET Framework 4.6.1 or later
ASP.NET	ASP.NET 4.0.30319 or later
MSXML	MSXML 6.0
	Note • MSXML is installed by the Workflow Manager installer.

Workflow Manager / AdminStudio Database Server

This following table lists the recommended system configuration for a Workflow Manager/AdminStudio Application Catalog database server:

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Note • While minimum requirements are listed below, the recommended system configuration for a database server is dependent upon the number of users and the number of packages that will be imported into the Application Catalog database

Item	Description
Processor	32-bit or 64-bit processor at 2 GHz or greater
RAM	4 GB or greater (8 GB preferred)
Hard Disk Space	80 GB or greater
Operating System	Windows Server 2008 R2 or later (Windows Server 2012 preferred)
Database Software	SQL Server 2008 R2 or later databases, including SQL Server 2012 and SQL Server 2014 (latest version preferred) • **Dictionary sort order**—SQL Server must be installed with case-insensitive dictionary sort order 52 on Code Page 1252 for non-Unicode data. For more information, use the `sp_helpsort` T-SQL command, which returns the following: `Latin1-General, case-insensitive, accent-sensitive, kanatype-insensitive, width-insensitive for Unicode Data, SQL Server Sort Order 52 on Code Page 1252 for non-Unicode data` • **Collation setting**—`SQL_Latin1_General_CP1_CI_AS` is the required collation setting for AdminStudio database server. It is the only supported collation. 📝 *Note • Before attempting to connect to an existing Microsoft SQL Server, open SQL Server Configuration Manager and make sure that the following three protocols are enabled:* • *Shared Memory* • *Named Pipes* • *TCP/IP*

File Share Server

This following table lists the system requirements for the machine that stores Workflow Manager's uploaded source files and the repackaged output files:

Item	Description
Processor	2 GHz or greater
RAM	2 GB or greater
Hard Disk Space	1 TB or greater
Operating System	Windows Server 2008 R2 or later

Workflow Manager End User Computers

This following table lists the recommended system configuration for a Workflow Manager 2016 end user machine:

Item	Description
Browser	• Microsoft Internet Explorer 9.0 or later • Chrome for Windows 33.0 or later • Firefox for Windows 25.0 or later • Safari for Mac OS X and iOS
Monitor Resolution	1024 x 768 pixels or higher

Portal Web Server for Intranet Clients

A portal is not required to support Windows NT authentication. You can enable Windows NT authentication directly on the web site.

Single sign-on is only supported when the user that logs into IIS has been imported into the Workflow Manager database using Active Directory. The administrator can either import the complete group or only one user. If a complete group is imported, then all the members of the group can be logged into Workflow Manager using single sign-on.

The system requirements for this machine are the same as for the Workflow Manager Web Server.

Portal Web Server for Internet Clients

For better security and to manage access to the Workflow Manager Web Server, it is recommend to also set up a portal Web server for Internet clients.

If Workflow Manager needs to be accessed over the Internet, it is recommended to set up a portal Web server, residing in a demilitarized zone (DMZ). This Web server:

- accepts the requests from the Internet clients,

- forwards them to the Workflow Manager,

- gets responses from the Workflow Manager, and

- forwards them to the clients

You can configure the Workflow Manager to entertain the request only if it is coming from the Portal Web server, and otherwise reject the request. The Portal Web server manages access to Workflow Manager and ensures that clients are not able to access any data or documents without logging in.

The system requirements for this machine are the same as for Workflow Manager Web Server.

Workflow Manager System Account Requirements

The `AMS_SYSTEM` account on the Workflow Manager server requires the following privileges:

- **IIS_WPG group member**—Must be a member of the local `IIS_WPG` group (or `IIS_USRS`) on the web server.

- **Modify permissions on file share**—Must have "modify" permissions on the Workflow Manager file share.

- **Email permissions**—Must have permission to send e-mail through the SMTP server.

- **Active Directory query permission**—Must have permission to query Active Directory.

- **Local Administrators group member**—If Workflow Manager will be calling any of the AdminStudio Platform APIs in the iPlugin DLL, the AMS_SYSTEM account must be a member of the local Administrators group.

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