

# ADMINISTRATORS GUIDE

## THORAPPS REFLEX REPORTING

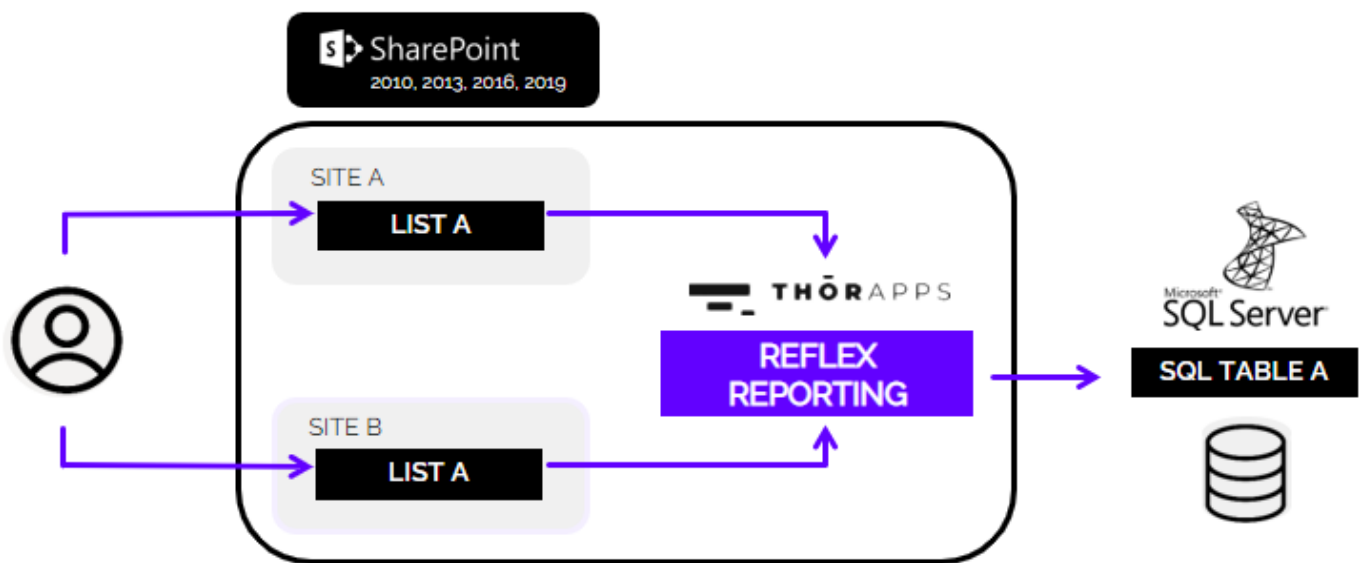
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## What is Reflex Reporting?

Reflex Reporting is a tool from ThorApps used to extract SharePoint list and library data, in real-time, into a dedicated reporting database. It collates the items from similarly structured lists or libraries from across multiple sites and site collections into dedicated reporting tables within the reporting database. This vastly improves the performance and flexibility of reporting on content stored across SharePoint and provides a “Best Practise” method to access the content in real-time without compromising Microsoft support of your SharePoint farm.



Reflex Reporting is a SharePoint on-premises application and supports SharePoint 2010 through to 2019 (SharePoint “Subscription” has not been tested yet, but it likely works).

If you’re after similar features for SharePoint online, please see our SharePoint Online Add-in “ListSync” in the SharePoint store, or on our web site ([www.thorapps.com](http://www.thorapps.com)).

## Overview

This document describes the prerequisites and actions required to install ThorApps Reflex Reporting into a SharePoint farm. The steps and requirements are the same in both SharePoint 2016 and 2019.

To ensure you have the latest version of this guide, please download it from...

<https://docs.thorapps.com/Downloads/OP/ReflexReporting/ThorApps Administration Guide - Reflex Reporting.pdf>

The high-level steps are:

- Download Reflex Reporting media (if not already done)
- Upload ThorApps Licence Manager and Reflex Reporting package files (.wsp)
- Deploy ThorApps Licence Manager and Reflex Reporting
- Configure Reflex Reporting databases (auto created)
- (Optional) Configure Reflex Reporting databases (manually created)

## Prerequisites

To follow this guide, you will need:

- A SharePoint 2016 or SharePoint 2019 farm
- Administrator level understanding of SharePoint terminology and navigation
- SharePoint Farm Administrator rights (the account should have SharePoint configuration database write access)
- Console access (either direct or remote) to the server hosting SharePoint Central Administration
- Permission to run SharePoint PowerShell commands on the server hosting SharePoint Central Administration

**NOTE:** When starting SharePoint Central Administration (CA), its required to do so from the Windows Start menu. This opens CA in an elevated mode and provides functionality that is not available (or does not work) when just opening a standard web browser session.

## Installation

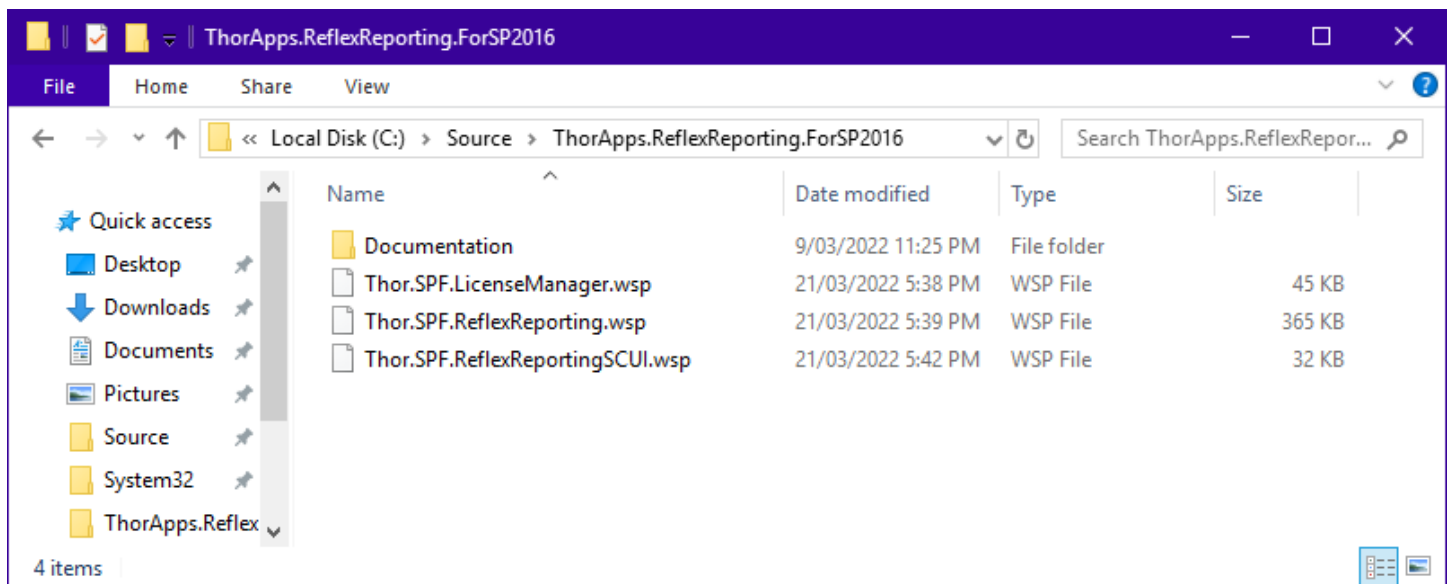
The following step's use a single stand-alone SharePoint 2019 server (called "devsp2019"). If you're installing into a multi-server SharePoint farm, you only need to run these steps on (one of) the server(s) hosting SharePoint Central Administration.

### Download Reflex Reporting

If you haven't already done so, download the latest Reflex Reporting 2016+ installation package from the ThorApps support and downloads site:

<https://docs.thorapps.com/Downloads/ThorApps.ReflexReporting.For2016.zip>

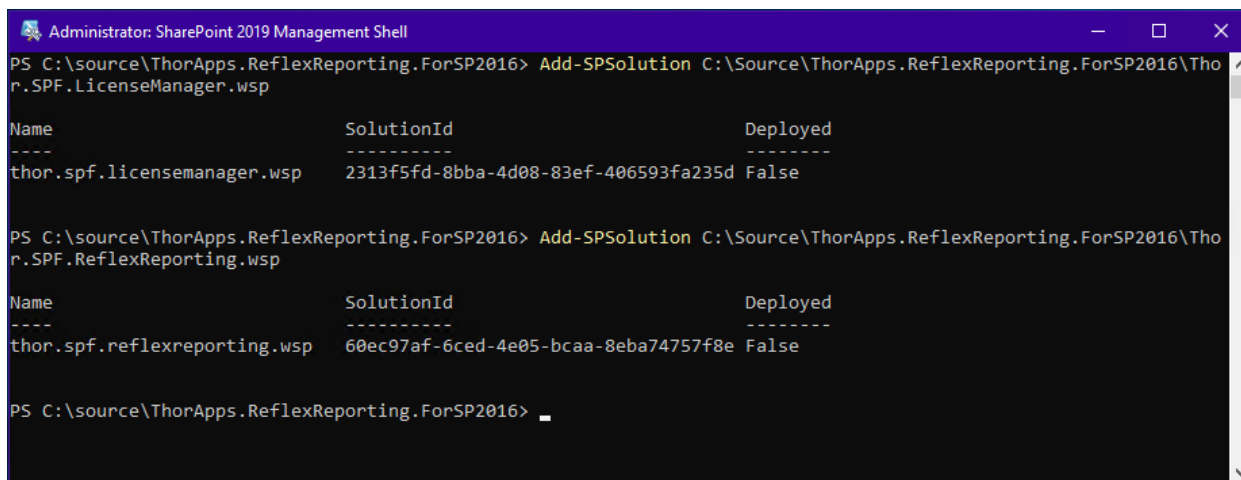
Copy the zip file to the server hosting SharePoint Central Administration and extract the contents to a local drive (This documentation is using C:\Source).



## Upload Package Files

At minimum, you will need to upload the 2 wsp packages, Thor.SPF.LicenseManager.wsp and Thor.SPF.ReflexReporting.wsp.

To upload the wsp packages to SharePoint, open a SharePoint PowerShell console as an Administrator and execute the command “Add-SPSolution” for each package.



```
Administrator: SharePoint 2019 Management Shell
PS C:\source\ThorApps.ReflexReporting.ForSP2016> Add-SPSolution C:\Source\ThorApps.ReflexReporting.ForSP2016\Thor.SPF.LicenseManager.wsp

Name                SolutionId                Deployed
----                -
thor.spf.licensemanager.wsp  2313f5fd-8bba-4d08-83ef-406593fa235d False

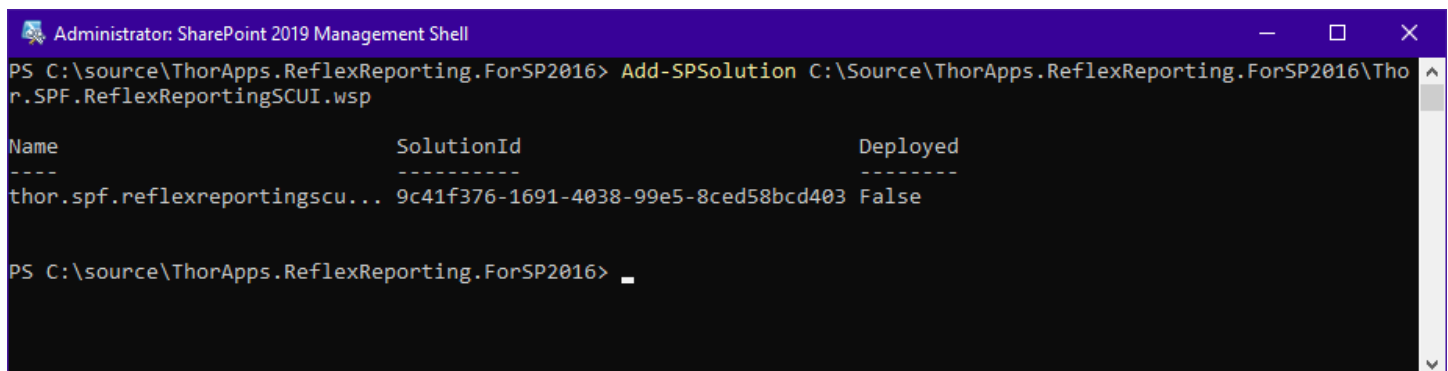
PS C:\source\ThorApps.ReflexReporting.ForSP2016> Add-SPSolution C:\Source\ThorApps.ReflexReporting.ForSP2016\Thor.SPF.ReflexReporting.wsp

Name                SolutionId                Deployed
----                -
thor.spf.reflexreporting.wsp  60ec97af-6ced-4e05-bcaa-8eba74757f8e False

PS C:\source\ThorApps.ReflexReporting.ForSP2016> _
```

### [Optional]

Reflex Reporting also provides an optional Site Collection level User Interface. If you need or want to provide site collection administrators with access to manage Reflex Reporting Schemas, you will also need upload this package (Thor.SPF.ReflexReportingSCUI.wsp).



```
Administrator: SharePoint 2019 Management Shell
PS C:\source\ThorApps.ReflexReporting.ForSP2016> Add-SPSolution C:\Source\ThorApps.ReflexReporting.ForSP2016\Thor.SPF.ReflexReportingSCUI.wsp

Name                SolutionId                Deployed
----                -
thor.spf.reflexreportingscu... 9c41f376-1691-4038-99e5-8ced58bcd403 False

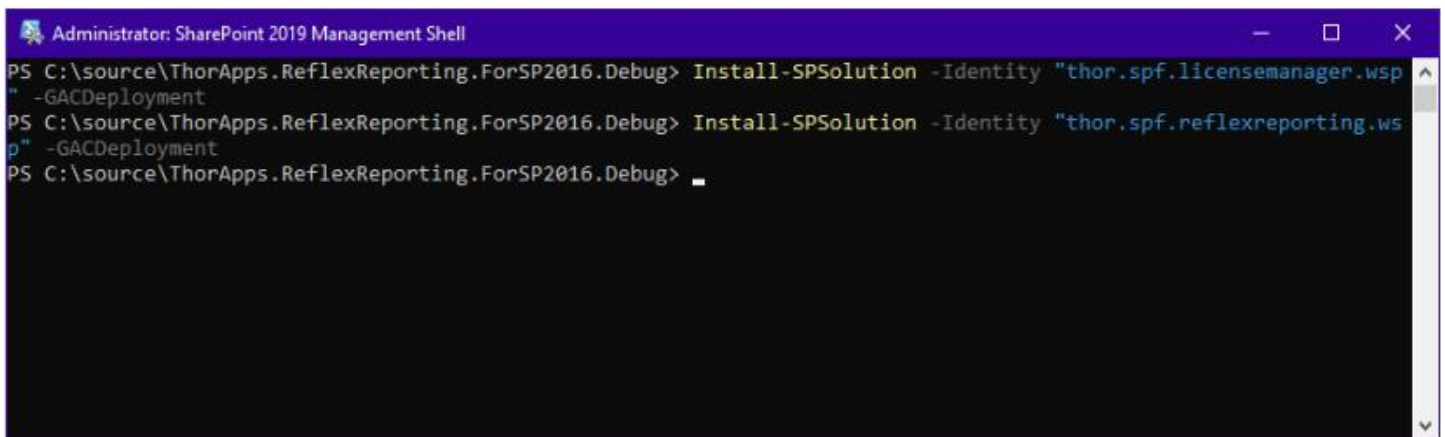
PS C:\source\ThorApps.ReflexReporting.ForSP2016> _
```

## Deploy Solutions

After uploading the wsp solution packages, you will need to deploy the solutions within SharePoint. This can either be done with the PowerShell command “Install-SPSolution”, or Open SharePoint Central Administration and deploy using the [System Settings]=>[Manage Farm Solutions] page.

### Deploy Using PowerShell

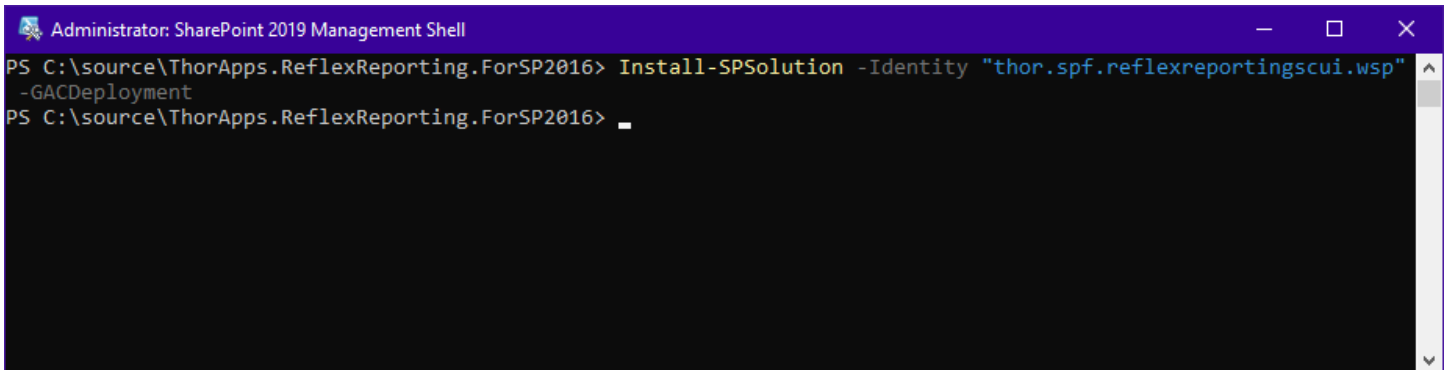
Use the PowerShell command “Install-SPSolution” with the -GACDeployment argument.



```
Administrator: SharePoint 2019 Management Shell
PS C:\source\ThorApps.ReflexReporting.ForSP2016.Debug> Install-SPSolution -Identity "thor.spf.licensemanager.wsp" -GACDeployment
PS C:\source\ThorApps.ReflexReporting.ForSP2016.Debug> Install-SPSolution -Identity "thor.spf.reflexreporting.wsp" -GACDeployment
PS C:\source\ThorApps.ReflexReporting.ForSP2016.Debug>
```

### [Optional]

If you uploaded the “Thor.SPF.ReflexReportingSCUI.wsp” package, you’ll also want to deploy it.

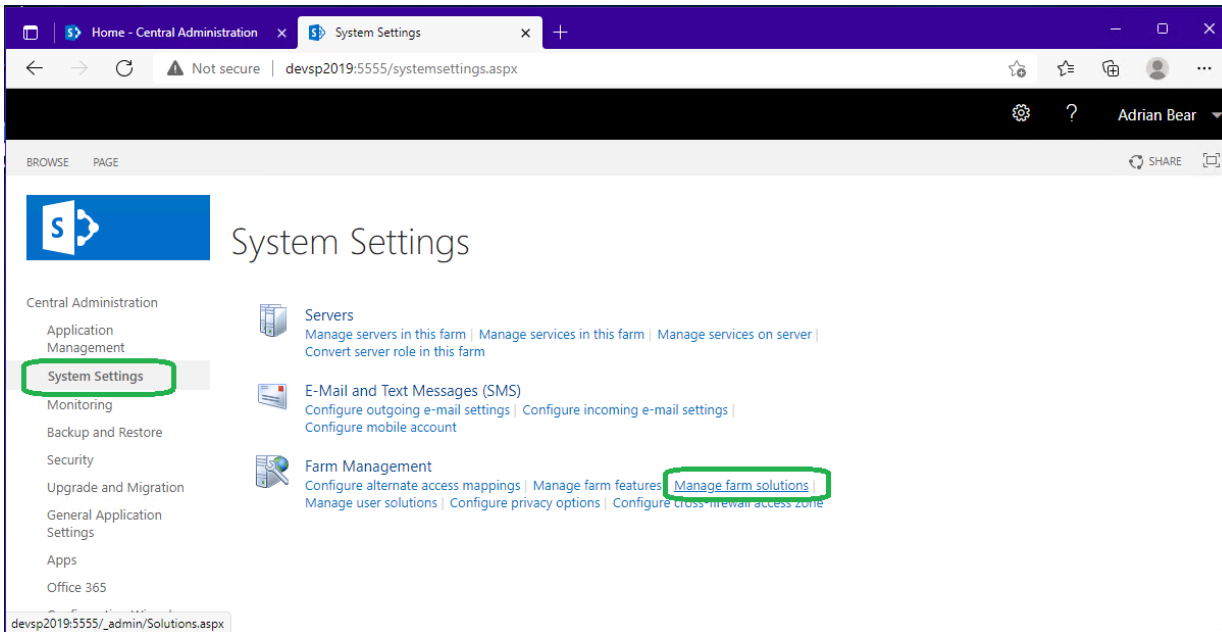


```
Administrator: SharePoint 2019 Management Shell
PS C:\source\ThorApps.ReflexReporting.ForSP2016> Install-SPSolution -Identity "thor.spf.reflexreportingscui.wsp" -GACDeployment
PS C:\source\ThorApps.ReflexReporting.ForSP2016>
```

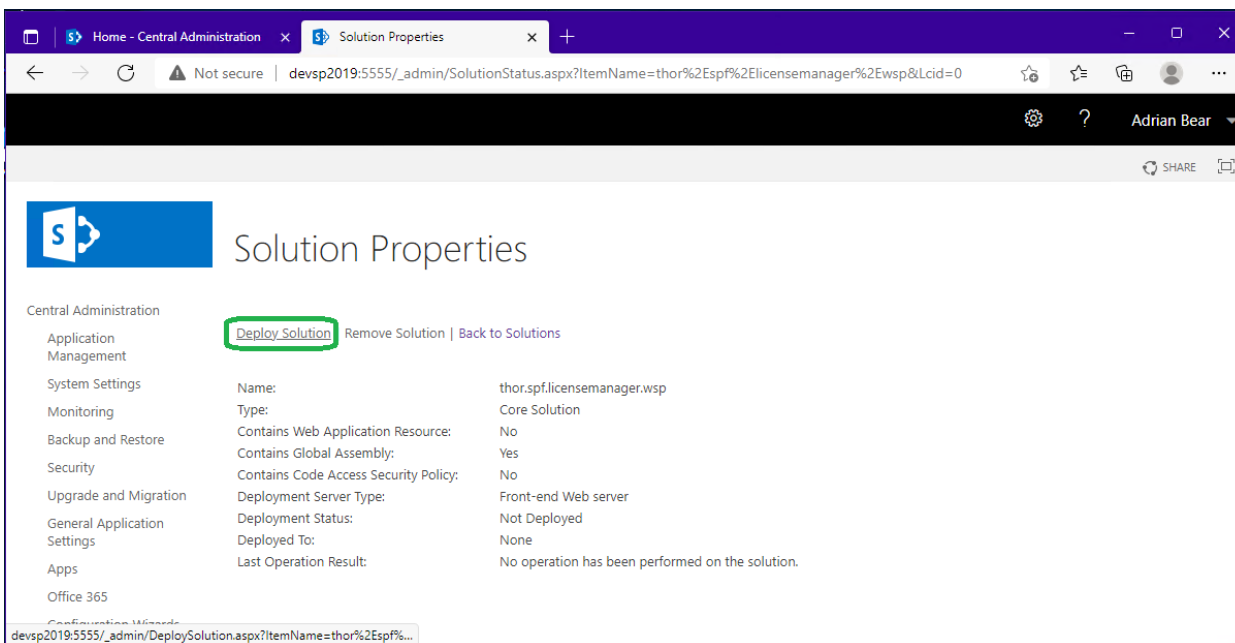


## Deploy using SharePoint Central Administration pages

Navigate to [System Settings]>[Manage farm solutions]



From the list of SharePoint farm solutions displayed, click through each of the ThorApps packages and click “Deploy Solution”.



Both required wsp packages are “global” and do not require any further parameters, just click “OK” to deploy.

Home - Central Administration x Deploy Solution x

Not secure | devsp2019:5555/\_admin/DeploySolution.aspx?ItemN...

Adrian Bear

SHARE

# Deploy Solution ⓘ

**Central Administration**

- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Apps
- Office 365
- Configuration Wizards

**Solution Information**  
Information on the solution you have chosen to deploy.

Name: thor.spf.licensemanager.wsp  
Locale: 0  
Deployed To: None  
Deployment Status: Not Deployed

**Deploy When?**  
A timer job is created to deploy this solution. Please specify the time at which you want this solution to be deployed.

Choose when to deploy the solution:

☒ Now  
☐ At a specified time:  
3/2/2022 7 PM 00

**Deploy To?**  
The solution contains no Web application scoped resource, and therefore cannot be deployed to a particular Web application. It can only be deployed globally.

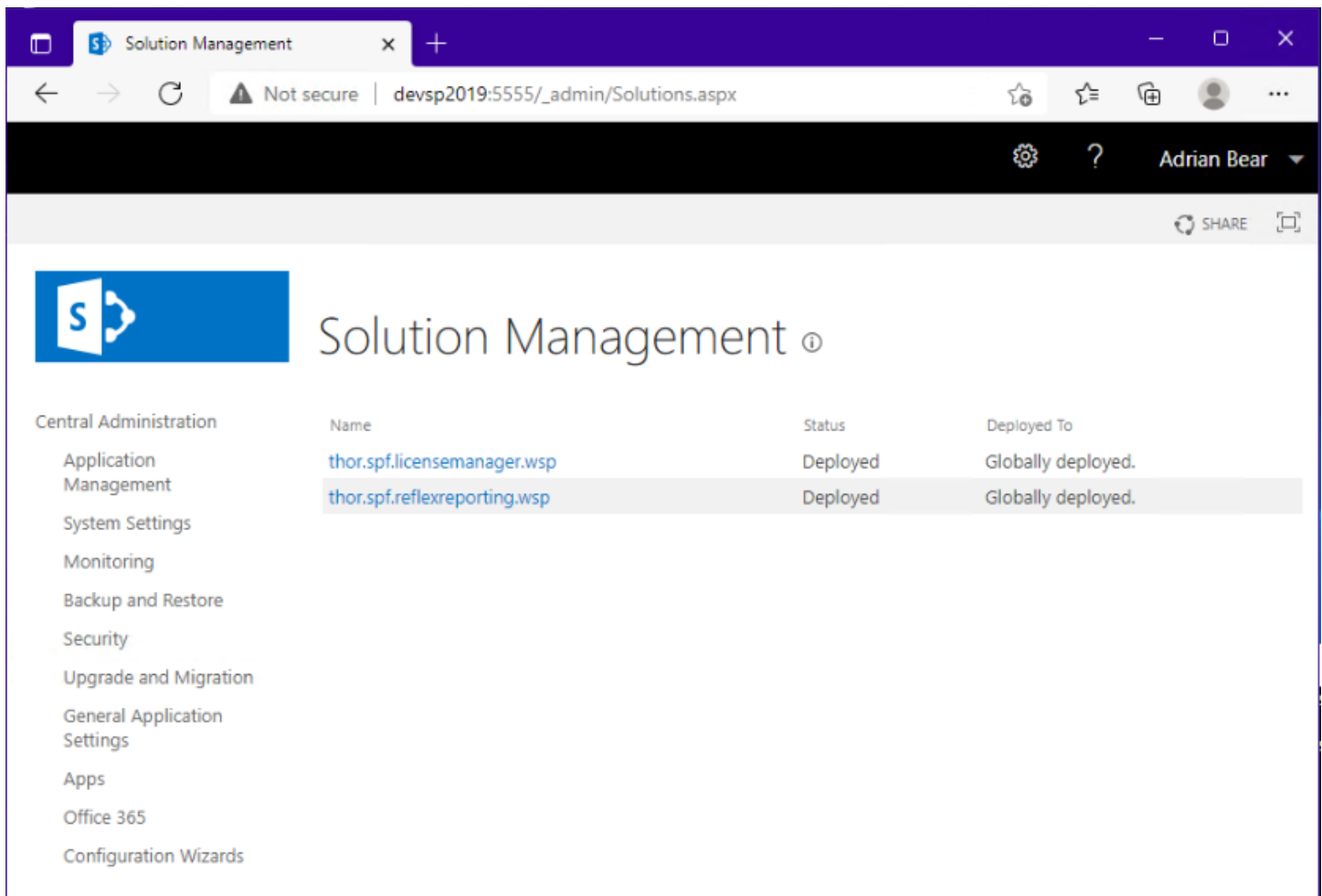
This solution deploys globally.

**Warning:** Deploying this solution will place assemblies in the global assembly cache. This will grant the solution assemblies full trust. Do not proceed unless you trust the solution provider.

OK Cancel

After deployment, you can verify the solutions have been deployed, by navigating to

[System Settings]=>[Manage farm solutions] in SharePoint Central Admin and reviewing the list of deployed solutions. Note the Status is “Deployed”.



The screenshot shows the SharePoint Solution Management page. The browser address bar indicates the URL is `devsp2019:5555/_admin/Solutions.aspx`. The page title is "Solution Management". On the left, there is a navigation menu with the following items: Central Administration, Application Management, System Settings, Monitoring, Backup and Restore, Security, Upgrade and Migration, General Application Settings, Apps, Office 365, and Configuration Wizards. The main content area displays a table of deployed solutions:

Name	Status	Deployed To
<a href="#">thor.spf.licensemanager.wsp</a>	Deployed	Globally deployed.
<a href="#">thor.spf.reflexreporting.wsp</a>	Deployed	Globally deployed.

## Reboot after install

After installing Reflex Reporting, it's a good idea to reboot all servers in the farm to ensure all services pickup the Reflex Reporting DLL's.

## Reflex Reporting Configuration Database Setup

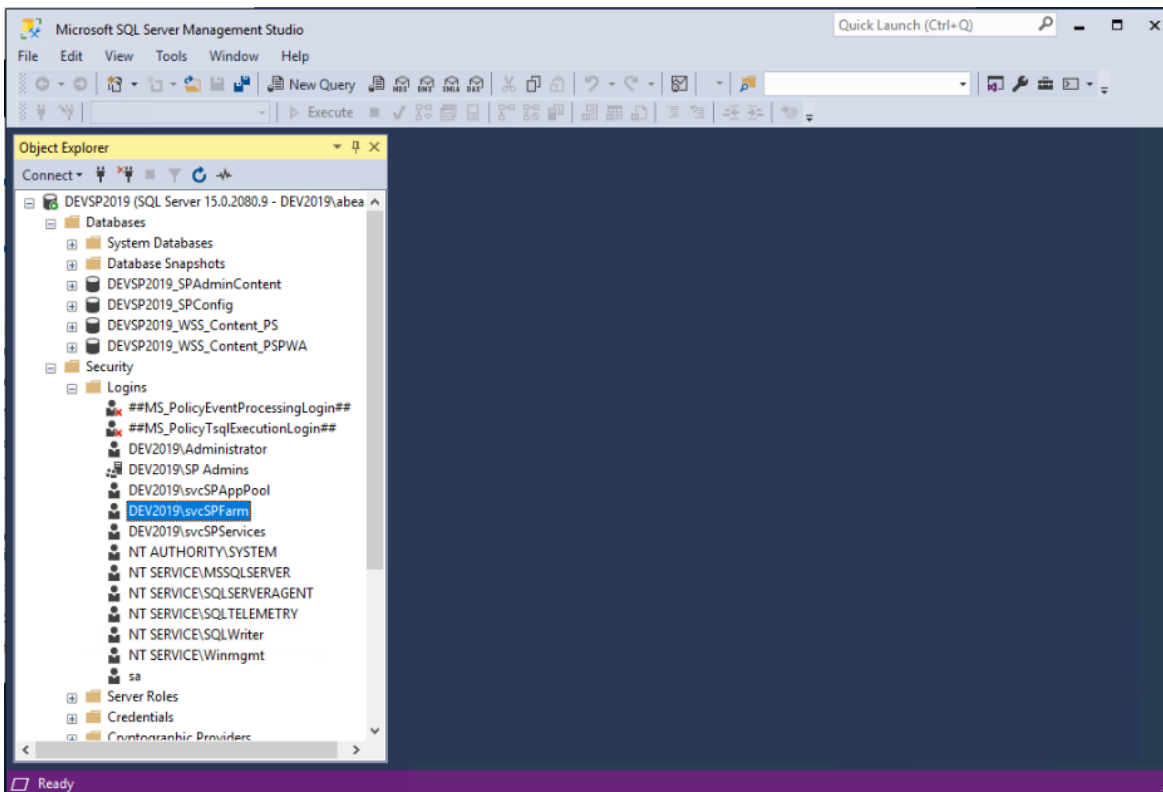
Reflex Reporting uses a Microsoft SQL database to store and manage the “Reporting Schemas” created. This database should be separate from the Reporting database you create in later steps, but can be re-used as a reporting if you desire. This database is referred to as either the Reflex Reporting “Configuration” or “Schemas” database.

The “Configuration” database can be either be created new using the Reflex Reporting pages or the same pages can be used to “attach” to a new empty database and will provision the required SQL objects within it. If you’re attaching to an empty database, the database must have the SharePoint Farm account configured as a database owner on the empty database before starting these steps.

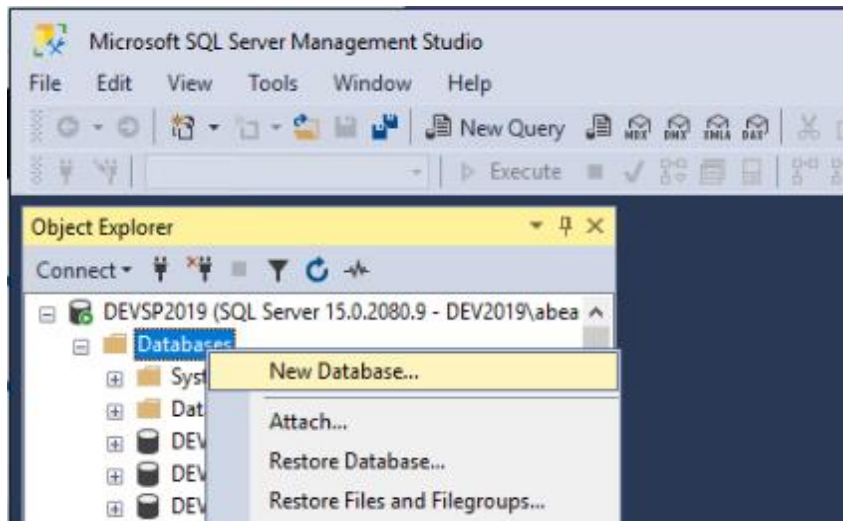
### [Optional] Create a new blank database for Reflex Reporting Configuration

To create a new blank database for the Reflex Reporting configuration, you will need to use SQL Server Management Studio (SSMS).

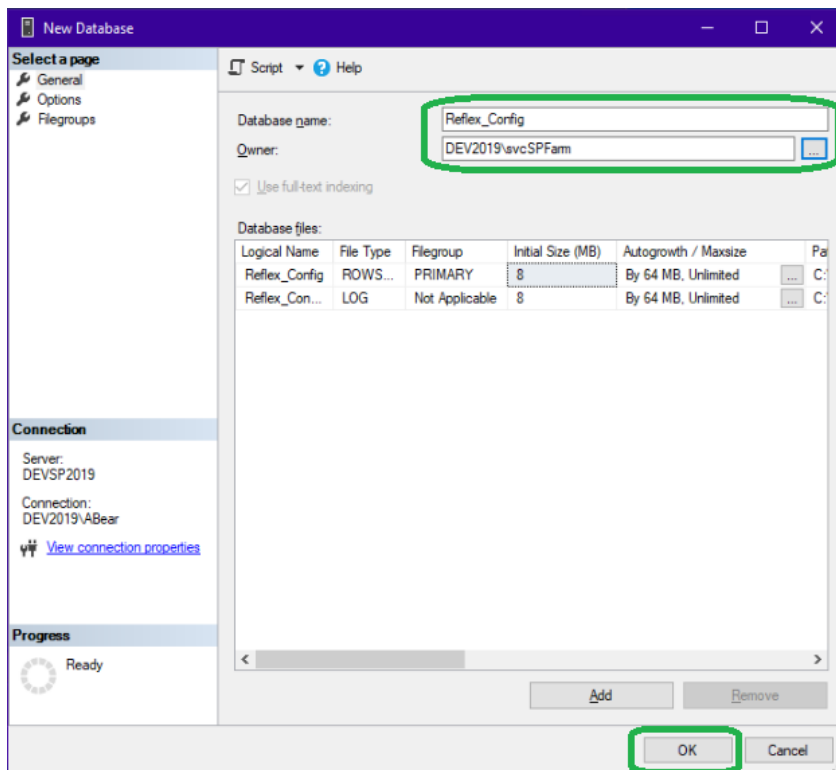
Open SSMS and connect to the server hosting the SharePoint databases. Take note, that the SharePoint Farm account is already configured as a user on this SQL server.



Right click on the [Databases] node in the [Object Explorer] and select “New Database...”



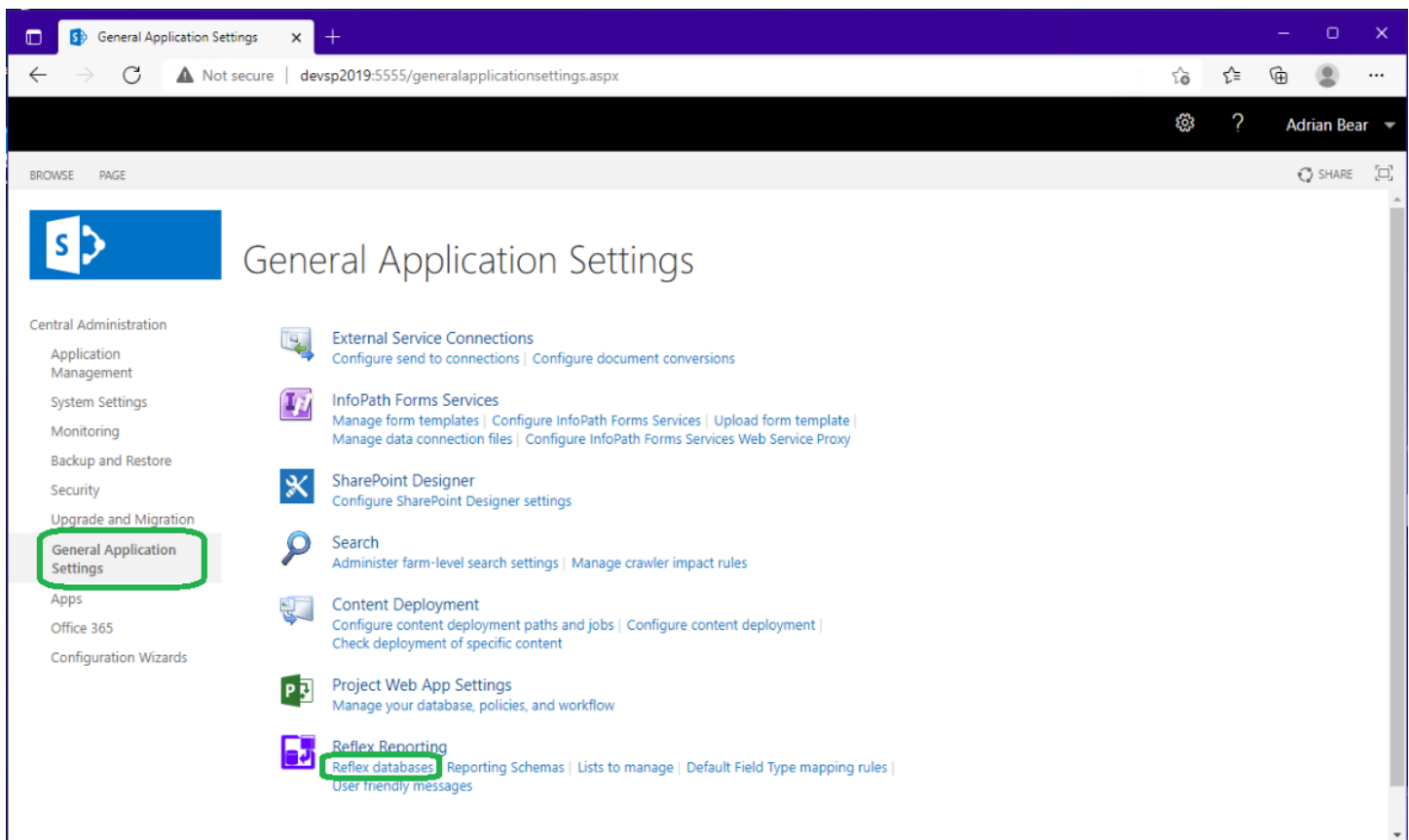
Enter a new “Database name”, set the “Owner” as the SharePoint farm account and click “OK”.



Return to SharePoint Central Administration and follow the next section.

## Create (or attach) a Reflex Reporting Configuration database

From SharePoint Central Administration navigate to [General Application Settings]=>[Reflex Databases].



Normally this page will display the list of Reporting databases, but when there is no configuration database setup, this page will prompt you to configure the Reflex Reporting configuration database.

Enter a new database name or the name of a blank database you wish to configure and click “OK”.

The screenshot shows the 'Reflex Reporting' configuration interface. On the left is a navigation menu with options like 'Central Administration', 'Application Management', 'System Settings', 'Monitoring', 'Backup and Restore', 'Security', 'Upgrade and Migration', 'General Application Settings', 'Apps', 'Office 365', 'Configuration Wizards', and 'Site contents'. The main content area is titled 'Reflex Reporting' and 'Use this page to configure the Reflex Schema and Reporting databases'. It contains three sections: 'Reflex Schema Database' (with instructions on default settings and authentication), 'Database authentication' (with radio buttons for 'Windows authentication (recommended)' and 'SQL authentication'), and 'Failover Server' (with instructions on failover server association). The 'Database Name' field is highlighted with a green box and contains the text 'Reflex\_Config'. The 'Database Server' field contains 'DEVSP2019'. The 'Failover Database Server' field is empty. The 'OK' button is highlighted with a green box.

This step will take a few minutes while the new database is setup.

Once it is finished it will display the normal, but empty, list of Reporting databases.

## License Activation

To apply a subscription license or trial extension, please refer to the ThorApps License Manager Guide.



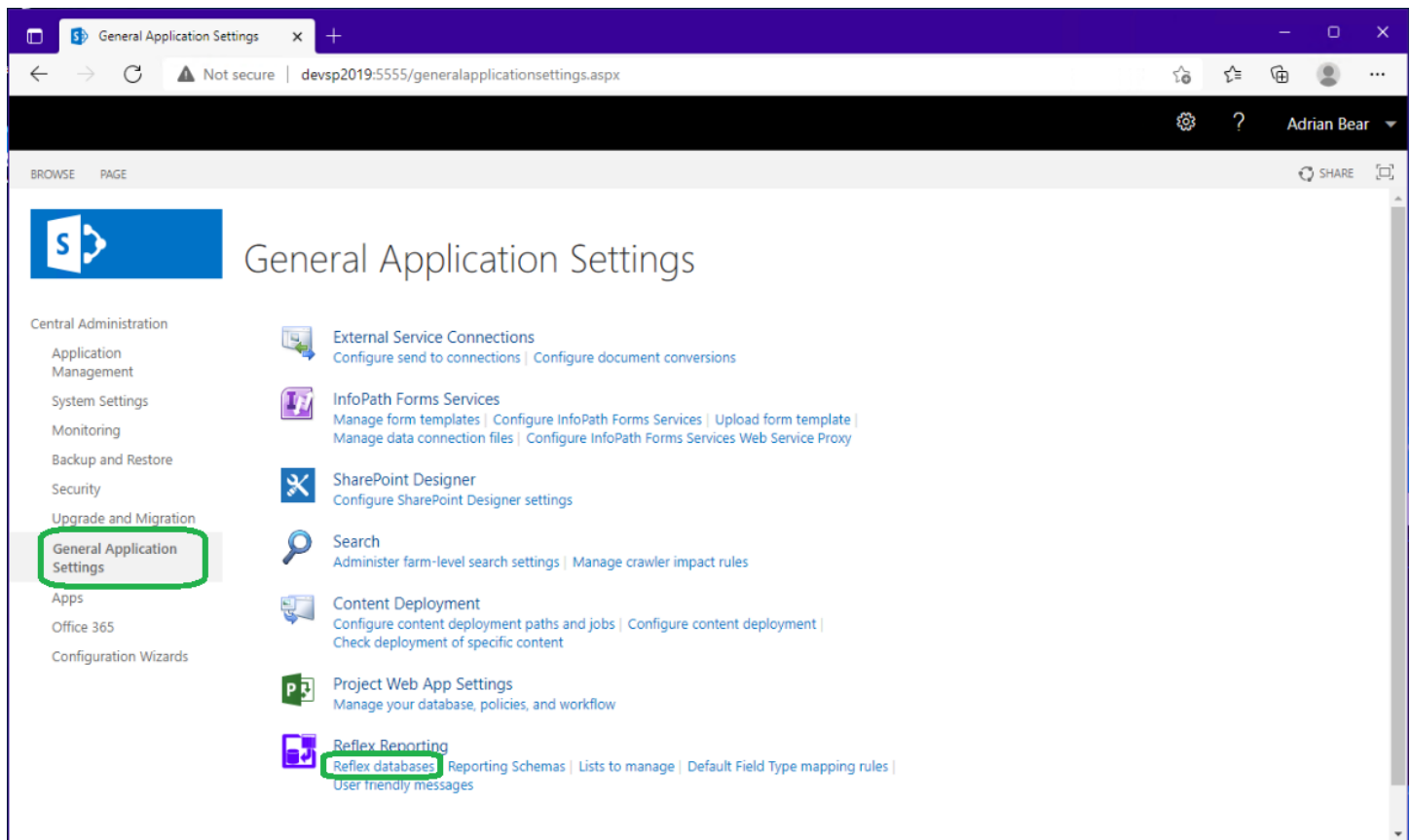
## Configuration

The following sections describe the steps to configure various Reflex Reporting features. The first step must be to configure a Reporting database.

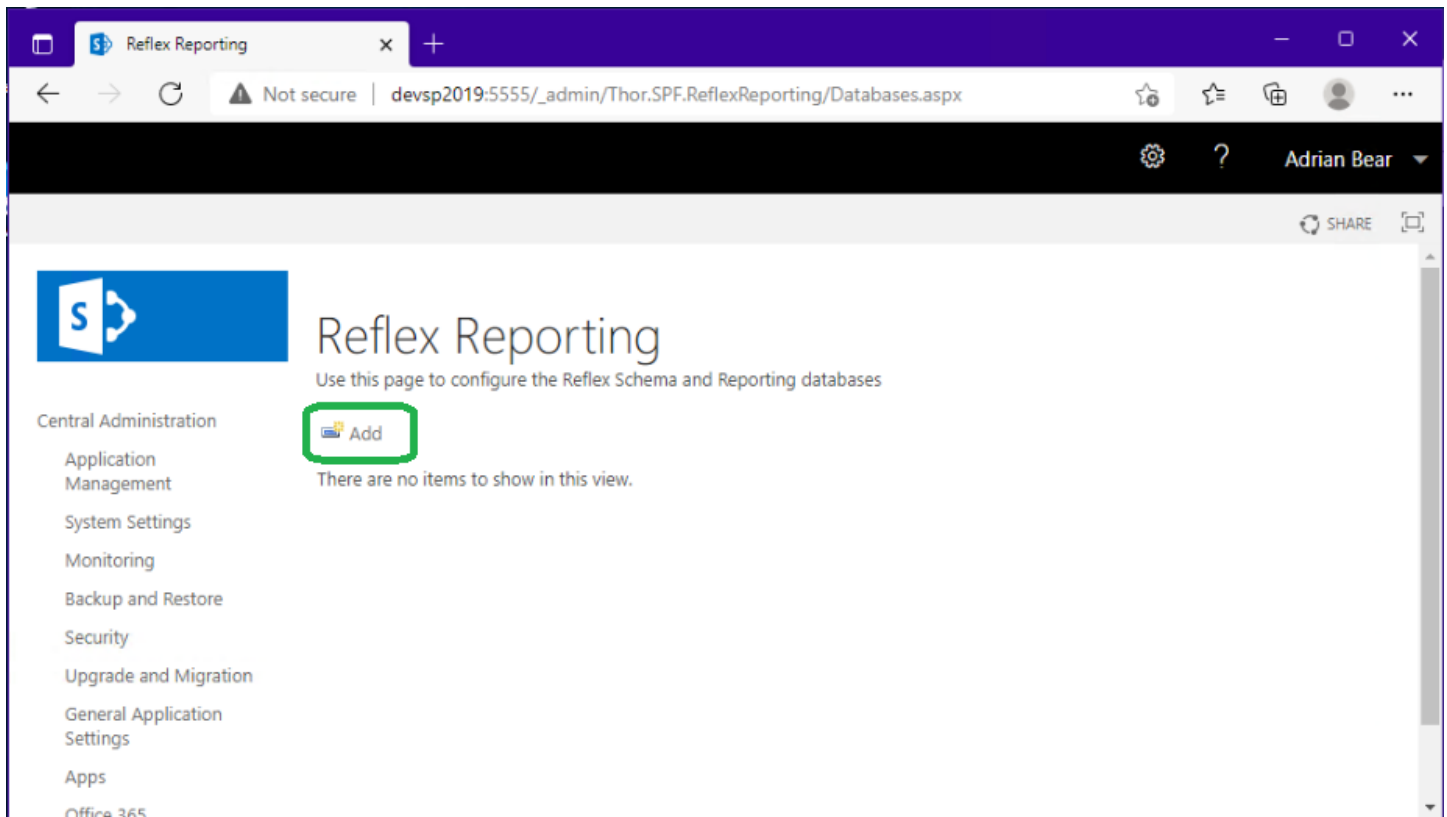
### Create a Reflex Reporting database

Reflex Reporting allows you to setup multiple reporting databases to store the data for different reporting schemas. This can be used to separate data and access for different areas within your business (i.e., Sales vs Operations).

From SharePoint Central Admin, navigate to [General Application Settings]=>[Reflex databases]

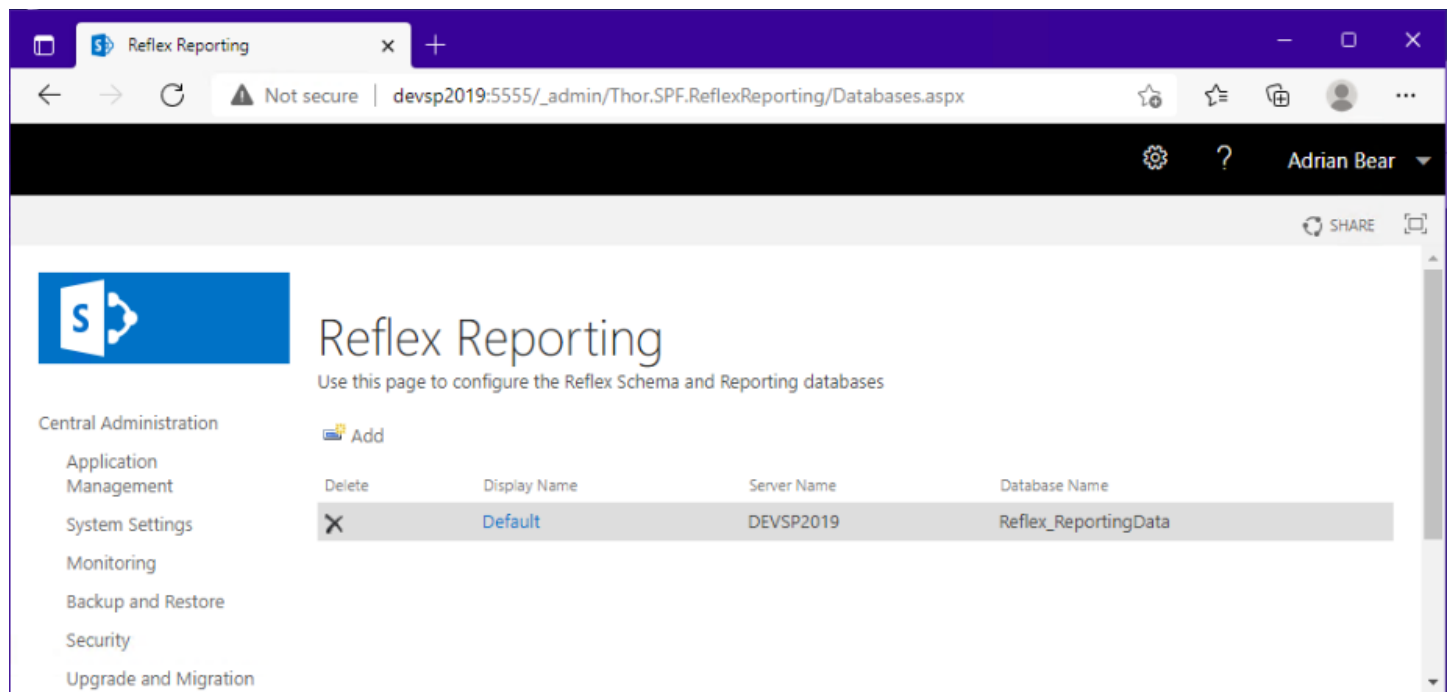


If no reporting databases have been configured, you will be prompted to confirm the Reflex “Configuration” database settings. Simply click “OK” to proceed through to the (empty) list of Reporting databases and click the “Add” button.



Enter a “Display Name” and a “Database Name” and click “OK”.

You will then be returned to the list of Reflex Reporting databases, which now contains your new reporting database.



You can now configure Reporting Schemas and list/library mappings to populate this database.

## Management User Interfaces

Reflex Reporting provides two alternate user interfaces for managing Reporting Schemas and list data reflection. The default is the interface built into SharePoint Central Administration and is described in the following sections.

The alternate interface is optional and requires you to install the “thor.spf.reflectreportingscui.wsp” package in previous steps. It provides the facility to manage reporting schemas and list data reflection from within a site collection’s site settings menus.

If you’d prefer to use the SCUI (site collection user interface), you should skip the next few sections and review the section “**Site Collection User Interface**”.

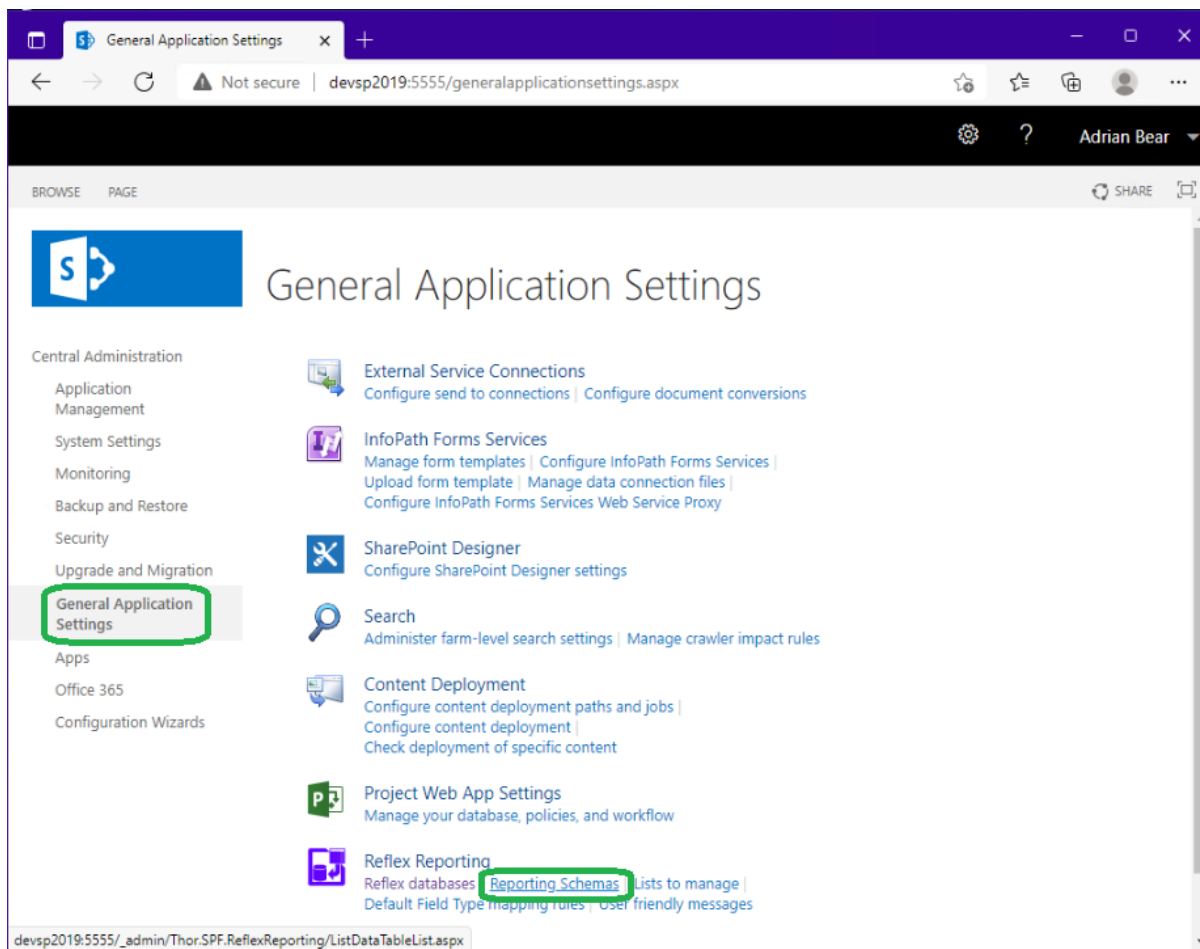
## Reporting Schemas (Central Admin)

In Reflex Reporting a “Reporting Schema” is a design for a SQL table. Each reporting schema is associated with a reporting database, in which, it will create a SQL table when the reporting schema is enabled. If the reporting schema is disabled, the SQL table is **DROPPED** from the associated reporting database, along with any custom indexes you may have added to it.

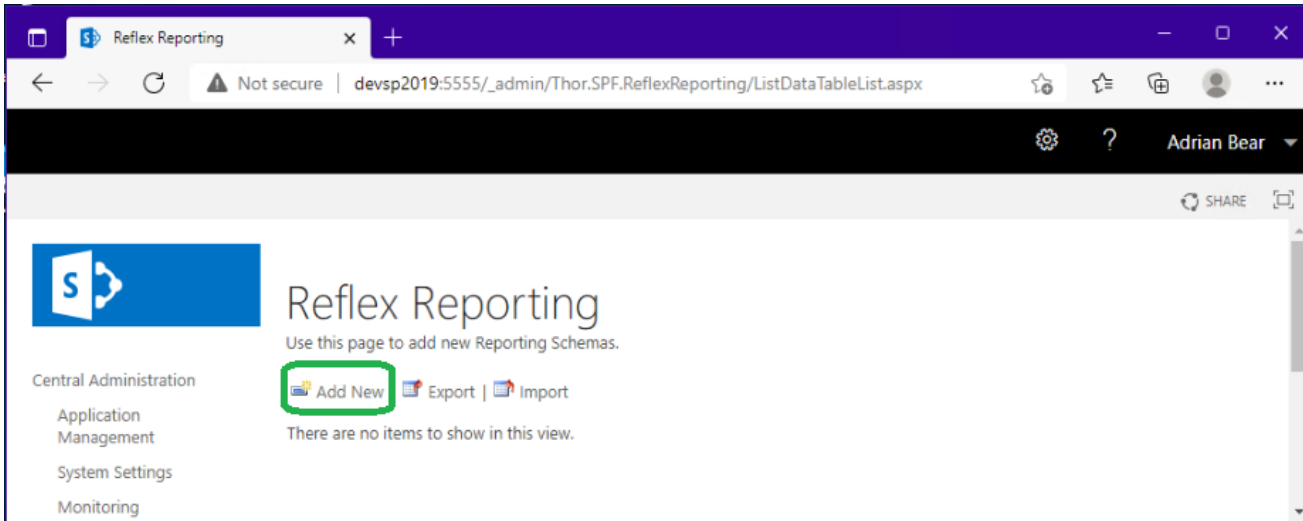
Reporting schemas are made up of a set of mapped fields (SQL fields to SharePoint List or Library fields). The fastest way to create a new reporting schema is to source the fields from a pre-existing SharePoint List (or Library).

### Create a new Reporting Schema

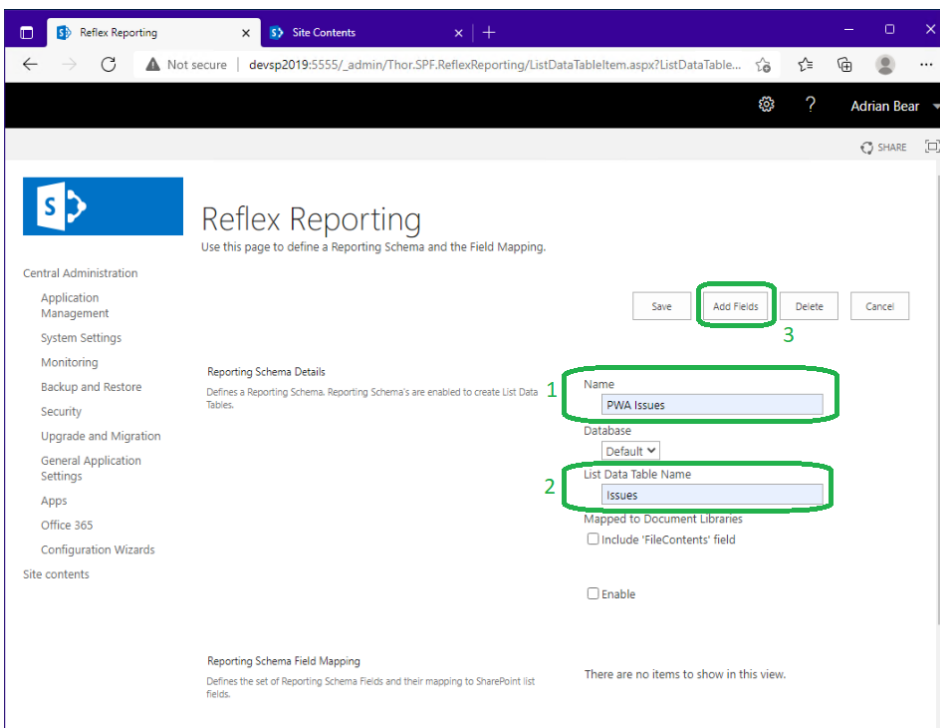
From SharePoint Central Administration, navigate to [General Application Settings]=[ Reporting Schemas].



On the list of Reporting Schemas, click “Add New”.

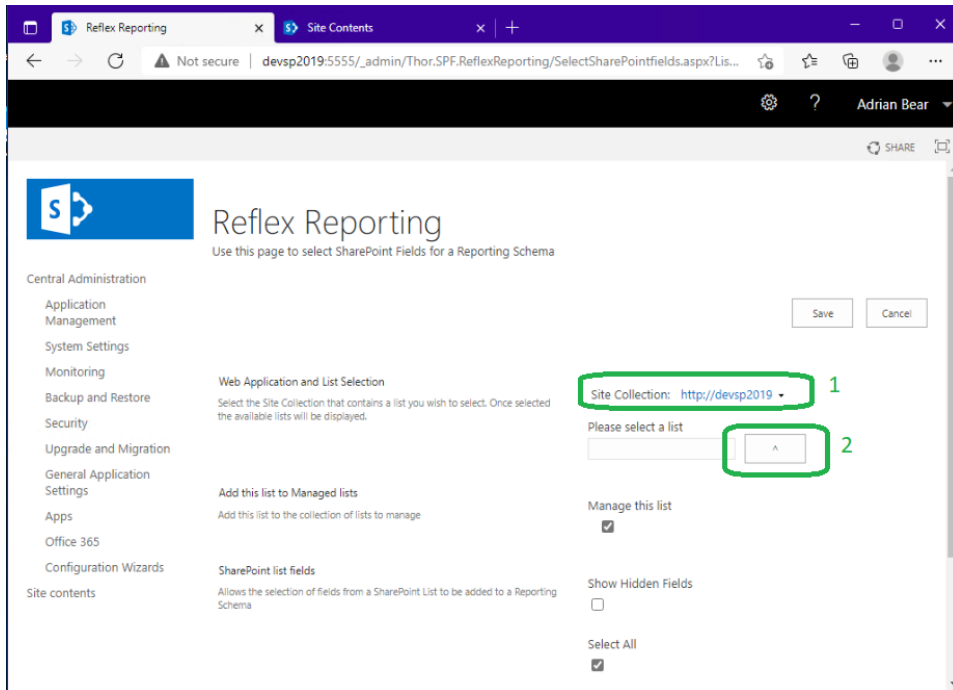


Enter a Name (this is the display name), a “List Data Table Name” (this will be used as the SQL table name) and click “Add Fields”.



The “Add Fields” button takes you to a page to select a SharePoint List (or library) instance. The selected list instance will be used automatically generate the fields for the reporting schema.

Select a site collection that contains a list you want to extract report data from and then select the list from the List lookup.



Once you have selected a list, the “fields” section will be populated, and you can click “Save”.

If there are fields you do NOT want as part of your reporting schema, you can uncheck them here before clicking “Save”.

The screenshot shows the 'Reflex Reporting' web application interface. The browser address bar indicates the URL: `devsp2019:5555/_admin/Thor.SPF.ReflexReporting/SelectSharePointfields.aspx?Lis...`. The user is logged in as 'Adrian Bear'. The main heading is 'Reflex Reporting' with the instruction: 'Use this page to select SharePoint Fields for a Reporting Schema'. On the left is a 'Central Administration' sidebar with links like 'Application Management', 'System Settings', 'Monitoring', 'Backup and Restore', 'Security', 'Upgrade and Migration', 'General Application Settings', 'Apps', 'Office 365', 'Configuration Wizards', and 'Site contents'. The main content area has three sections: 'Web Application and List Selection' with a description and a 'Save' button; 'Add this list to Managed lists' with a description and a checkbox; and 'SharePoint list fields' with a description and a 'Select All' checkbox. A green box highlights the 'Save' button. Another green box highlights the 'Site Collection' dropdown menu, which is set to 'http://devsp2019/PWA', and the 'Please select a list' dropdown menu, which is set to 'Issues'. A third green box highlights the 'Fields' section, which lists several fields with checkboxes: 'Owner [Owner]', 'Created By [Author]', 'Title [Title]', 'Due Date [DueDate]', 'Related Items [RelatedItems]', 'Status [Status]', and 'Discussion [Discussion]'. A green text box on the left side of the 'Fields' section states: 'Fields shown for the selected list will be added to the reporting schema'.

Reflex Reporting

Use this page to select SharePoint Fields for a Reporting Schema

Central Administration

- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Apps
- Office 365
- Configuration Wizards
- Site contents

Web Application and List Selection

Select the Site Collection that contains a list you wish to select. Once selected the available lists will be displayed.

Site Collection: <http://devsp2019/PWA>

Please select a list

Issues

Add this list to Managed lists

Add this list to the collection of lists to manage

Manage this list

☒

Show Hidden Fields

☐

Select All

☒

Fields

- ☒ Owner [Owner]
- ☒ Created By [Author]
- ☒ Title [Title]
- ☒ Due Date [DueDate]
- ☒ Related Items [RelatedItems]
- ☒ Status [Status]
- ☒ Discussion [Discussion]

Fields shown for the selected list will be added to the reporting schema

Save Cancel



After clicking “Save” you will be returned to the Reporting Schema page. Here you can review the reporting schema fields before clicking “Enable”. Once enabled, the reporting schema design will be locked, and the SQL table created. The list instance used to select the fields for mapping will automatically have the Reflex Event Receivers added and the list instance mapped to the reporting schema. A job will have been created to reflect that list instances data into the SQL table (this may take a few minutes to run).

**\*\* NOTE:** Only the list instance used to create the reporting schema has been configured. You still need to do some extra steps to sync/reflect the other list instances of a similar design in other sites. This is done through the “Lists to Manage” menu.

The screenshot shows the 'Reflex Reporting' web application interface. The browser address bar indicates the URL is `devsp2019:5555/_admin/Thor.SPF.ReflexReporting/ListDataTableItem...`. The user is logged in as 'Adrian Bear'. The main heading is 'Reflex Reporting' with a subtext: 'Use this page to define a Reporting Schema and the Field Mapping.' A 'Cancel' button is visible in the top right.

**Reporting Schema Details**  
 Defines a Reporting Schema. Reporting Schema's are enabled to create List Data Tables.

**Name**

**Database**

**List Data Table Name**

**Mapped to Document Libraries**  
☐ Include 'FileContents' field

☒ **Enable**

**Reporting Schema Field Mapping**  
 Defines the set of Reporting Schema Fields and their mapping to SharePoint list fields.

Delete	Field Name	Field Type	SharePoint Field Name	SharePoint Field Type
	Owner	varchar(255)	Owner	Person or Group
	Created By	varchar(255)	Author	Person or Group
	Title	varchar(255)	Title	Single line of text
	Due Date	datetime	DueDate	Date and Time
	Status	varchar(255)	Status	Choice
	Discussion	ntext	Discussion	Multiple lines of text
	Category	varchar(255)	Category	Choice

If at this point you open SQL Server Management Studio (SSMS) and Open the Reflex Reporting database, you will now find the SQL table created and (if you have wait just a few minutes) the table populated with the data from list instance that has been mapped.

SQLQuery1.sql - DEVSP2019.Reflex\_ReportingData (DEV2019\ABear (72)) - Microsoft SQL Server Management Studio

Object Explorer

- Connect
- dbo.ListDataField
- dbo.ListDataTable
- dbo.ListNameToManage
- dbo.ManagedSPList
- dbo.SchemaVersion
- dbo.Settings
- dbo.SPFieldType
- dbo.SqlFieldType
- Views
- External Resources
- Synonyms
- Programmability
- Service Broker
- Storage
- Security
- Reflex\_ReportingData
  - Database Diagrams
  - Tables
    - System Tables
    - FileTables
    - External Tables
    - Graph Tables
    - dbo.Issues
  - Views
  - External Resources
  - Synonyms
  - Programmability

SQLQuery2.sql - DE...EV2019\ABear (90)

```
/****** Script for SelectTopNRows command from SSMS ******/
SELECT TOP (1000) [ListUID]
, [ListItemId]
, [SiteUrl1]
, [ListTitle]
, [UpdateKey]
, [UpdateKeyDateTime]
, [Owner]
, [Created By]
, [Title]
, [Due Date]
, [Status]
, [Discussion]
, [Category]
, [Resolution]
```

Results

	Created By	Title	Due Date	Status	Discussion	Category	Resolution	Modified By	Assigned To	Created	Priority	M
1	DEV2019\ABear	Issue 1	2022-03-30 00:00:00.000	(1) Active	NULL	(2) Category2	NULL	DEV2019\ABear	Administrators for Project Web App	2022-03-09 15:16:24.000	(2) Medium	2
2	DEV2019\ABear	Issue 2	2022-03-30 00:00:00.000	(1) Active	NULL	(2) Category2	NULL	DEV2019\ABear	DEV2019\ABear	2022-03-09 15:16:25.000	(2) Medium	2
3	DEV2019\ABear	Issue 3	2022-03-30 00:00:00.000	(1) Active	NULL	(2) Category2	NULL	DEV2019\ABear	Portfolio Managers for Project Web App	2022-03-09 15:16:26.000	(2) Medium	2

Query executed successfully. DEVSP2019 (15.0 RTM) | DEV2019\ABear (72) | Reflex\_ReportingData | 00:00:00 | 3 rows

The next step is to review the automatically created mapping entry (in the section [Lists to Manage]) and add event receivers so that all list instances with the same Title in the site collection will be “hooked up” and processed.

## Edit a Reporting Schema

To edit a reporting schema, you must first "disable" it.

**\*\* NOTE \*\*** Disabling a reporting schema WILL DROP its related SQL table from the reporting data. This is by design to ensure that all records in the reporting tables are valid during any reporting. So, you will need to issue reporting outage period notifications to your users.

From SharePoint Central Administration navigate to [General Application Settings]>[Reporting Schemas] and click the reporting schema you want to edit. Then uncheck the "Enable" box.

The screenshot shows the 'Reflex Reporting' configuration page in a web browser. The page title is 'Reflex Reporting' with the subtitle 'Use this page to define a Reporting Schema and the Field Mapping.' The left sidebar contains a 'Central Administration' menu with options like Application Management, System Settings, Monitoring, Backup and Restore, Security, Upgrade and Migration, General Application Settings, Apps, Office 365, and Configuration Wizards. The main content area is titled 'Reporting Schema Details' and includes a description: 'Defines a Reporting Schema. Reporting Schema's are enabled to create List Data Tables.' The configuration fields are: 'Name' (PWA Issues), 'Database' (Default), 'List Data Table Name' (Issues), and 'Mapped to Document Libraries' (Include 'FileContents' field). The 'Enable' checkbox is checked and highlighted with a green box. At the bottom, there is a 'Reporting Schema Field Mapping' section with a table header: 'Delete', 'Field Name', 'Field Type', 'SharePoint Field Name', and 'SharePoint Field Type'.

Once the reporting schema is disabled, you will be able to click the “Add Field” button.

The screenshot shows the Reflex Reporting web application interface. The browser's address bar displays the URL: `devsp2019:5555/_admin/Thor.SPF.ReflexReporting/ListDataTableItem.aspx?ListDataTa...`. The user is logged in as Adrian Bear. The main heading is "Reflex Reporting" with the subtitle "Use this page to define a Reporting Schema and the Field Mapping." On the left, a "Central Administration" sidebar lists various system settings. The main content area is titled "Reporting Schema Details" and includes a description: "Defines a Reporting Schema. Reporting Schema's are enabled to create List Data Tables." To the right of this description are four buttons: "Save", "Add Field" (highlighted with a green rectangle), "Delete", and "Cancel". Below the buttons, there are input fields for "Name" (containing "PWA Issues"), "Database" (a dropdown menu set to "Default"), and "List Data Table Name" (containing "Issues"). There are also checkboxes for "Mapped to Document Libraries" (with an option to "Include 'FileContents' field") and "Enable". At the bottom, a section titled "Reporting Schema Field Mapping" is partially visible, showing a table with headers: "Delete", "Field Name", "Field Type", "SharePoint Field Name", and "SharePoint Field Type".

The reporting schema “Add Field” page allows you to select a field from any list in any site from any site collection, but it’s a really good idea to pick the field from a list that is mapped to the reporting schema. If you pick a field from a list that is not mapped, the schema will not match the lists mapped and data sync/reflection will fail.

Click “Save”.

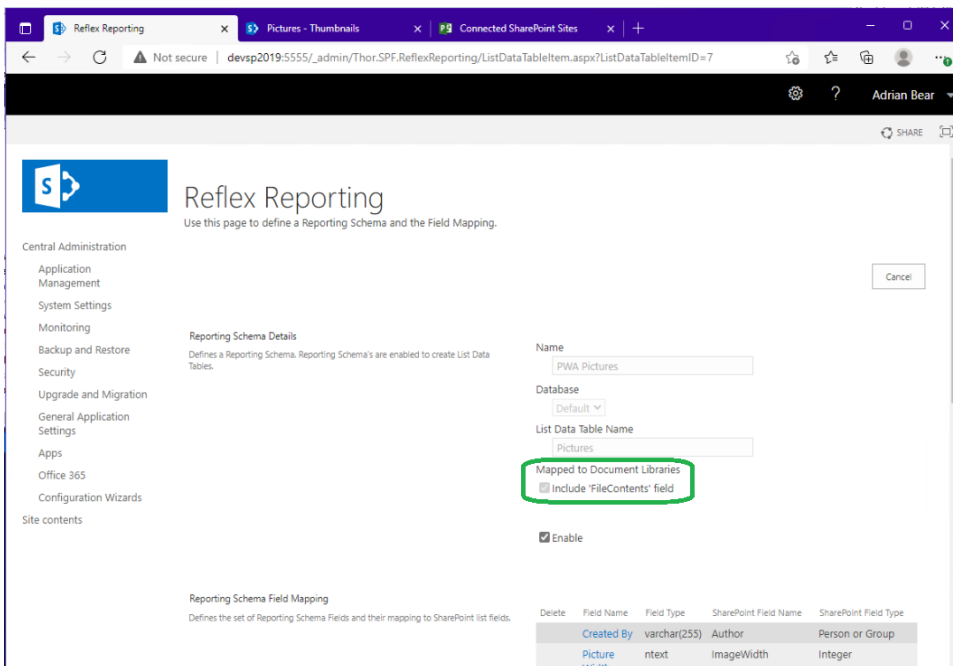
Once you have added the new field, you will be returned to the reporting schema edit page. Here you can click “Enable” to re-create the SQL table.

**\*\* Note \*\*** Because the SQL table was dropped, there will be no data. You can either wait for the daily timer job to re-sync all the data into the SQL table or you can manually kick off the daily job immediately (see the section [Trigger a Full Sync (Process All)]).

## Reflecting Document/Picture Libraries

Reflex Reporting supports the reflection of document libraries. This is most helpful when Pictures you want to use in reporting are stored in a SharePoint picture library.

To reflect the binary data of a document (or a Picture) stored in a Document Library, simply check the box “Mapped to Document Libraries” in the reporting schema. This will add a binary data field to the SQL table called “FileContents”.



Reflex Reporting

Use this page to define a Reporting Schema and the Field Mapping.

Central Administration

- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Apps
- Office 365
- Configuration Wizards
- Site contents

Reporting Schema Details

Defines a Reporting Schema. Reporting Schema's are enabled to create List Data Tables.

Name: PWA Pictures

Database: Default

List Data Table Name: Pictures

Mapped to Document Libraries: ☒ Include FileContents field

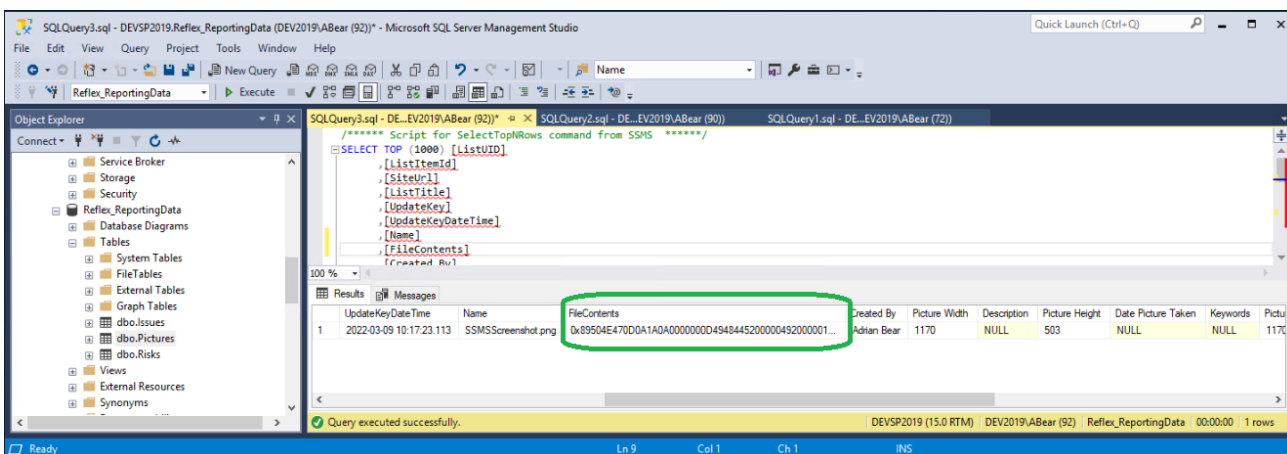
☒ Enable

Reporting Schema Field Mapping

Defines the set of Reporting Schema Fields and their mapping to SharePoint list fields.

Delete	Field Name	Field Type	SharePoint Field Name	SharePoint Field Type
	Created By	varchar(255)	Author	Person or Group
	Picture Width	ntext	ImageWidth	Integer

In SQL Server Management Studio (SSMS) document blobs/binary fields look like this.



SQLQuery3.sql - DEVSP2019.Reflex\_ReportingData (DEV2019\ABear (92)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

Object Explorer

- Service Broker
- Storage
- Security
- Reflex\_ReportingData
  - Database Diagrams
  - Tables
    - System Tables
    - FileTables
    - External Tables
    - Graph Tables
    - dbo.Issues
    - dbo.Pictures
    - dbo.Risks
    - Views
    - External Resources
    - Synonyms

Script for SelectTopRows command from SSMS \*\*\*\*\*

```
SELECT TOP (1000) [ListUID]  
,[ListItemId]  
,[SiteId]  
,[ListTitle]  
,[UpdateKey]  
,[UpdateKeyDateTime]  
,[Name]  
,[FileContents]  
FROM [Reflex_ReportingData].[dbo].[Pictures]
```

Results

	UpdateKeyDateTime	Name	FileContents	Created By	Picture Width	Description	Picture Height	Date Picture Taken	Keywords	Picture
1	2022-03-09 10:17:23.113	SSMSScreenshot.png	0x89504E470D0A1A0A000000004948445200000492000001...	Adrian Bear	1170	NULL	503	NULL	NULL	1170

Query executed successfully. DEVSP2019 (15.0 RTM) DEV2019\ABear (92) Reflex\_ReportingData 00:00:00 1 rows

## Troubleshooting

It's important to remember there are 3 key elements required for Reflex Reporting to reflect a lists item's, in real-time, into a SQL table.

1. A Reporting Schema that matches the list fields
2. A List Instance mapping (List to Manage)
3. The Reflex Reporting event receivers attached to the list

Make sure any new sites are created from a site template, that includes the Reflex Reporting Event Receivers attached the required lists. Otherwise, the content from new sites will not be reflected into SQL.

## Reflex Jobs

Many tasks in Reflex Reporting are processed through background jobs. The progress of jobs can be monitored in the Reflex Reporting configuration database in a table called "dbo.Jobs". Do not edit the content of this table, but you may view it just to check that jobs are processing. Keep in mind jobs are processed by one-time SharePoint timer jobs and may take up to 5 minutes to start. Jobs will trigger child jobs, so the list of jobs may grow. Reflex reporting automatically manages this table and will clean-up old jobs by deleting them.

## Lists to Manage

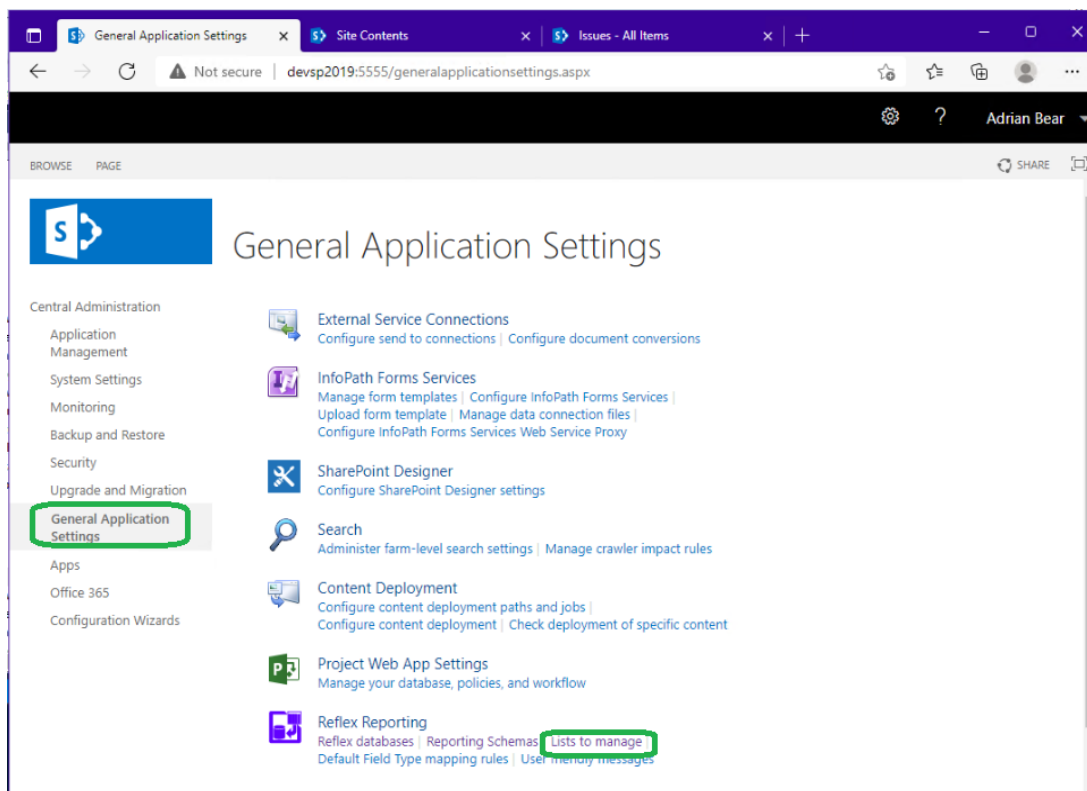
The “Lists to Manage” pages allow you to manage the mappings between reporting schemas, site collections and lists (by Title). It also provides a mechanism to add the Reflex Reporting event receivers to list instances.

In the last step, an entry in “Lists to Manage” was created by default for the list used to create the reporting schema, however, this only added the event receivers to that single list instance.

To reflect the items from all list instances with that same title in the site collection, requires you to also add the add the Reflex Reporting Event Receivers to the list instances.

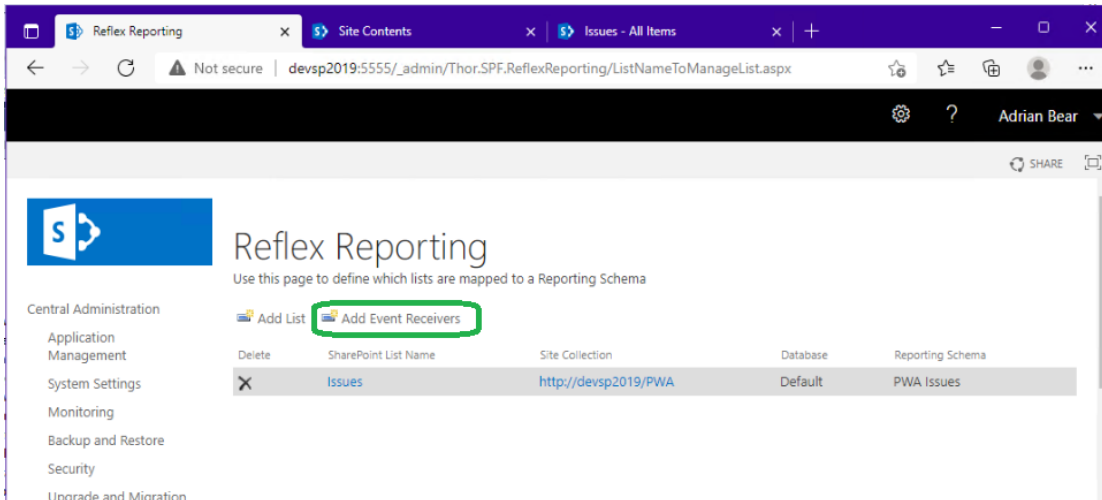
## Add Event Receivers

To add the event receivers to the mapped lists in a site collection, from SharePoint Central Administration, navigate to [General Application Settings]>[Lists to Manage]

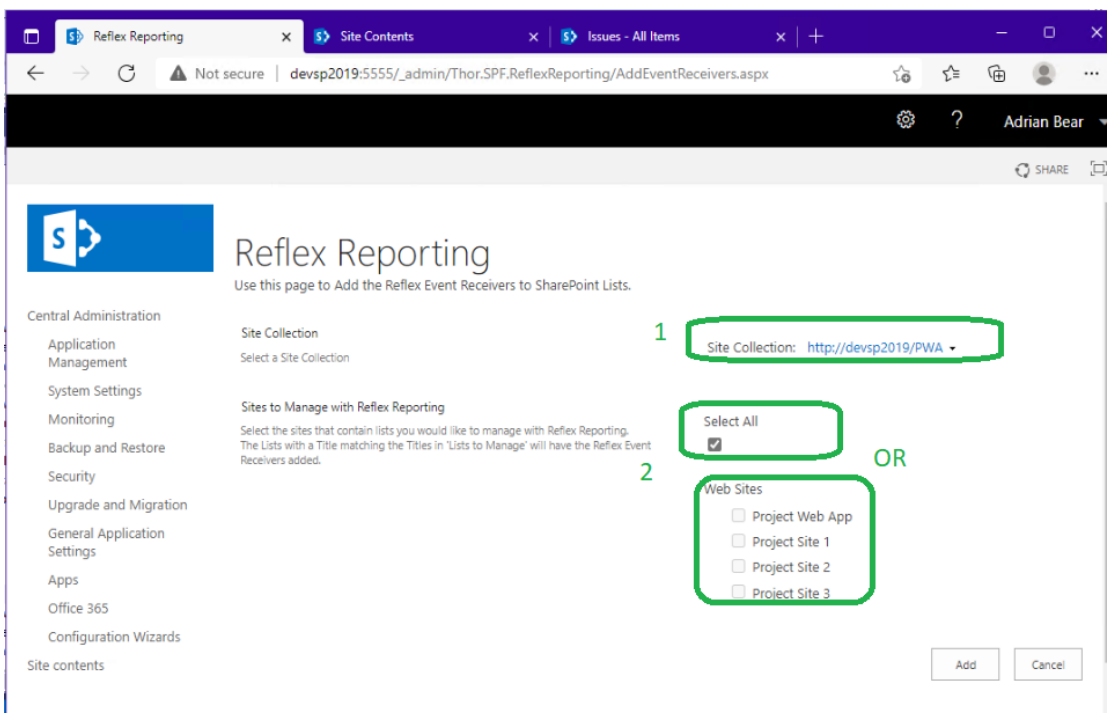




Within the “Lists to Manage” page, click the “Add Event Receivers” button.



On the “Add event receivers” page, select the site collection and sites that contain the lists you want to add the event receivers to and click “Add”.

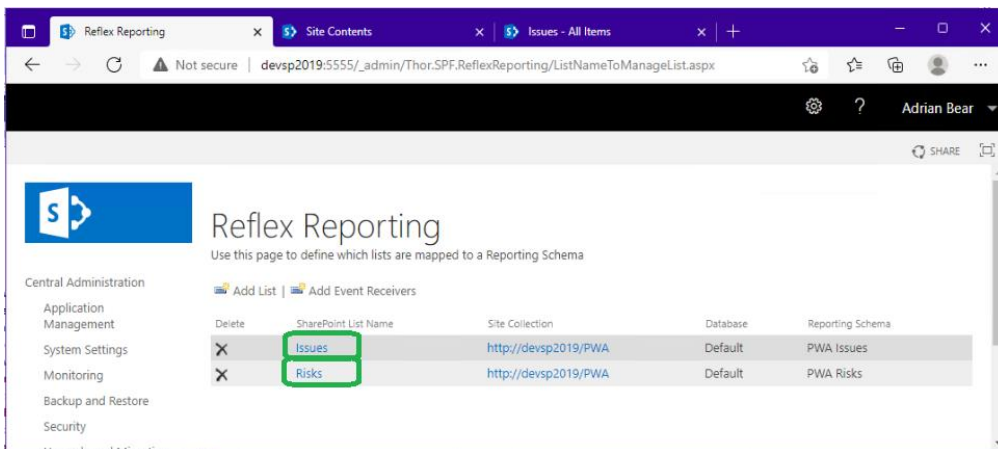


This will cycle through each of the selected sites and add the event receivers. If there are lots of sites, it may take a few minutes.

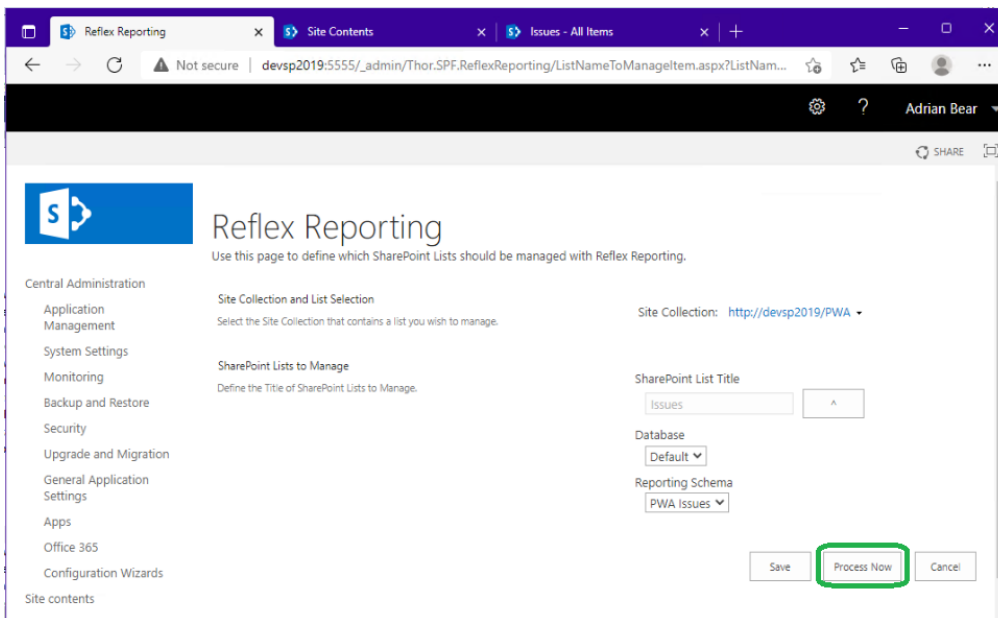
While this will have added the event receivers to the lists, it will not have kicked off a job to reflect the list items. So, after adding event receivers, you need to click through each list title and kick off a “Process Now”.

## Manually trigger a sync/reflect job for lists

From SharePoint Central Administration navigate to [General Application Settings]>[Lists to Manage].  
For each mapping to process, click the “List Title”.

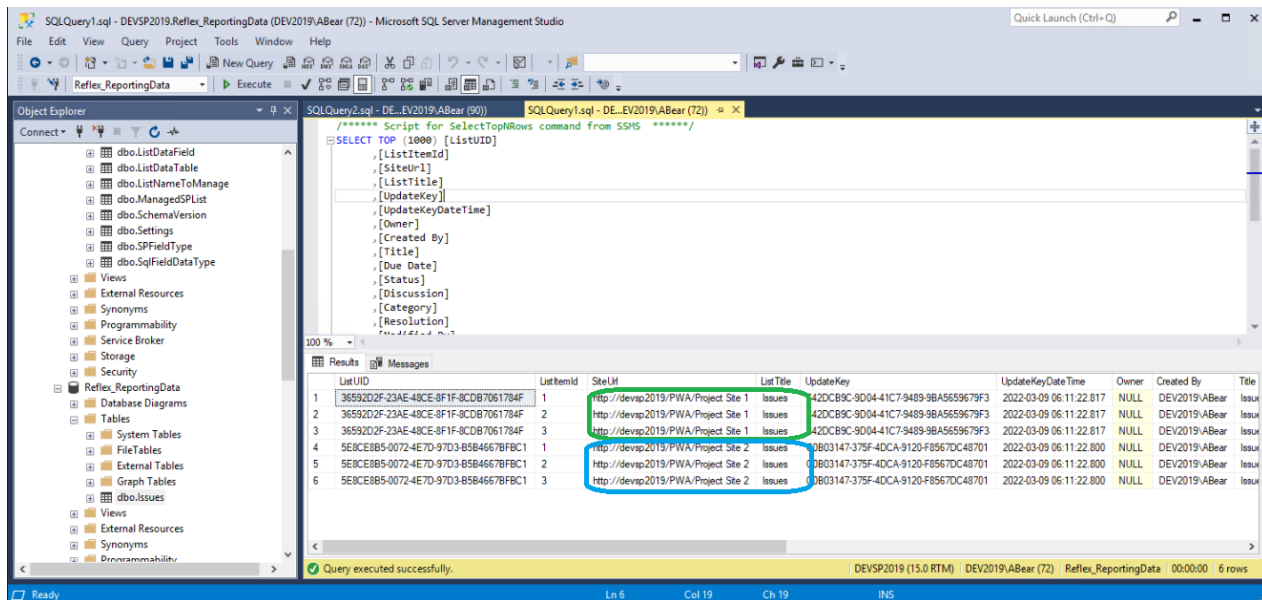


On the List mapping page, click “Process Now”.



This will kick off a background job to sync/reflect the mapped list's items into SQL.

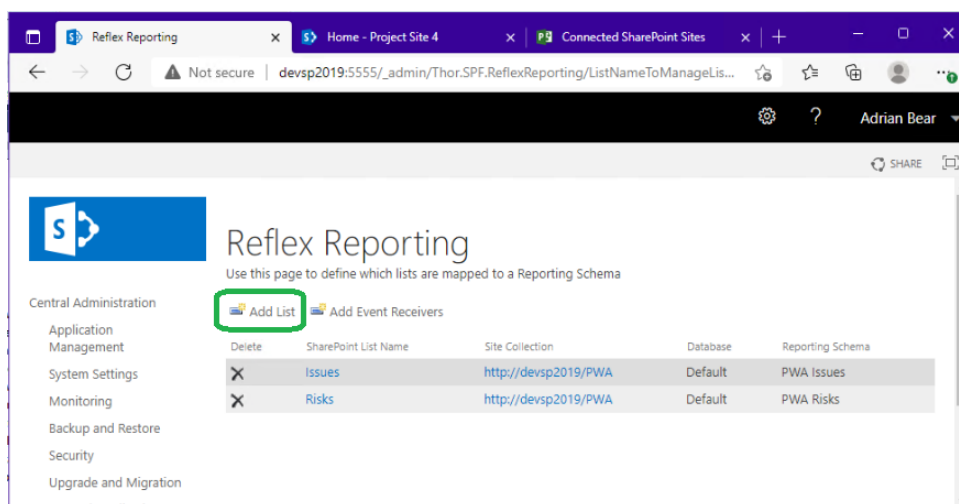
Once the background job to sync/reflect list items has finished, you should see the list item data from multiple sites in your SQL tables.



## Mapping additional site collections

You may have common list structures spread across multiple site collections in your SharePoint farm. Reflex Reporting allows you to map these common lists from across site collections into a single reporting table by adding site collections to the “Lists to Manage” page.

From SharePoint Central Administration navigate to [General Application Settings]=[Lists to Manager] and click “Add List”.



On the Lists to Manage, Add List page, select the alternate Site Collection, pick your List and the reporting schema you want to map the list title to.

Reflex Reporting

Use this page to define which SharePoint Lists should be managed with Reflex Reporting.

Central Administration

- Application Management
- System Settings
- Monitoring
- Backup and Restore
- Security
- Upgrade and Migration
- General Application Settings
- Apps
- Office 365
- Configuration Wizards
- Site contents

Site Collection and List Selection

Select the Site Collection that contains a list you wish to manage.

Site Collection: <http://devsp2019/pws1> 1

SharePoint List Title

Issues 2

Database

Default

Reporting Schema

PWA Issues 3

Save Cancel

Click "Save".

**\*\* Note\*\*** Adding a new list mapping, does not add event receivers or trigger the list to be synced/reflected. You need to again click "Add Event Receivers", wait for that to finish, and click into the new list mapping again to "Process Now". Once the sync/reflection job has completed, you will be able to see the data in SQL.

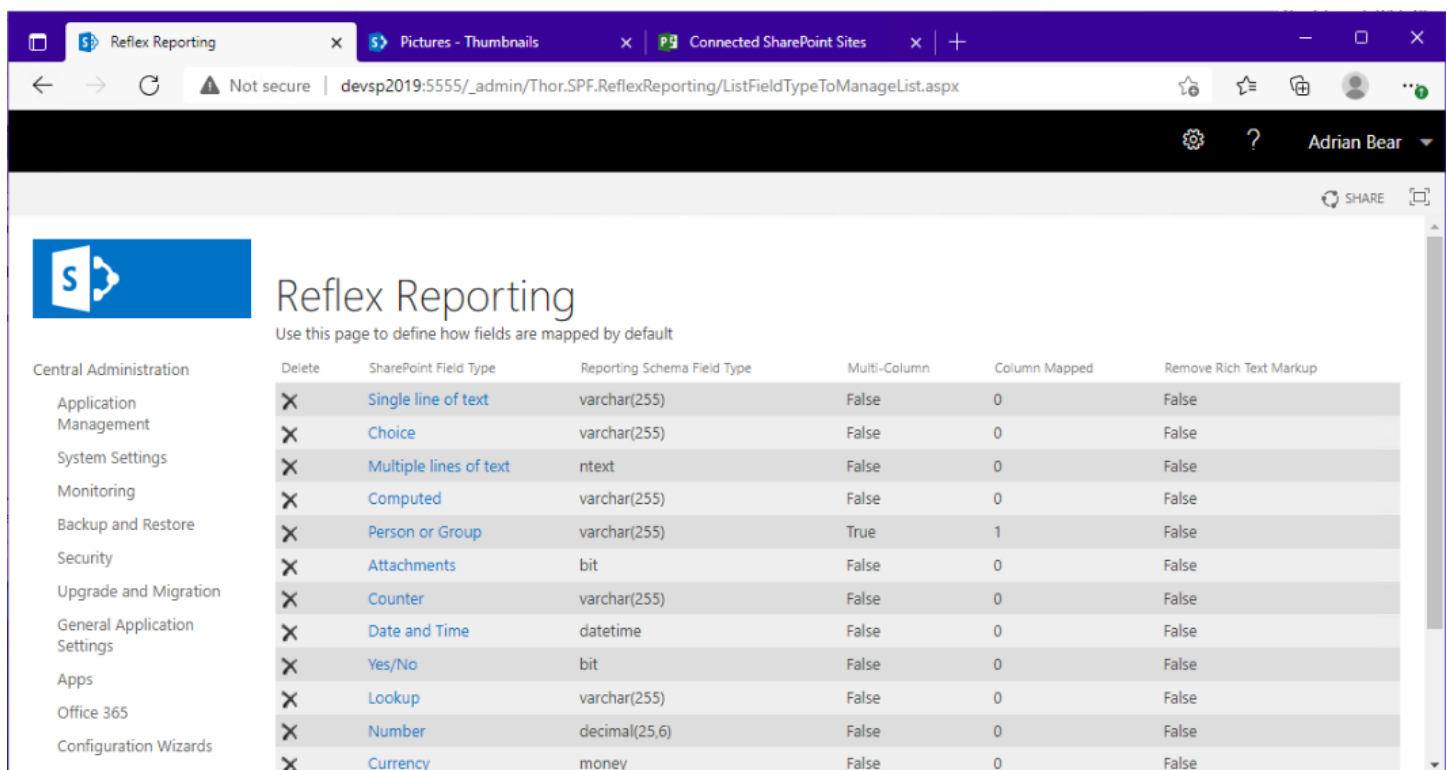
ListUID	ListTitle	SiteURL	UpdateKey	UpdateKeyTime	Owner	Created By
0C799ACB-DC72-4BA6-961E-17652AC4EABC	Issues	http://devsp2019/pws1/Project Site 4	10E0CD3D-95C0-431D-8502-1356B8B26E88	2022-03-09 09:03:22.853	Adrian Bear	DEV2019:ABear
36592D2F-23AE-48CE-8F1F-8CDB7061784F	Issues	http://devsp2019/PWA/Project Site 1	642DCB9C-9D04-41C7-9489-9BA5659679F3	2022-03-09 06:11:22.817	NULL	DEV2019:ABear
36592D2F-23AE-48CE-8F1F-8CDB7061784F	Issues	http://devsp2019/PWA/Project Site 1	642DCB9C-9D04-41C7-9489-9BA5659679F3	2022-03-09 06:11:22.817	NULL	DEV2019:ABear
36592D2F-23AE-48CE-8F1F-8CDB7061784F	Issues	http://devsp2019/PWA/Project Site 1	642DCB9C-9D04-41C7-9489-9BA5659679F3	2022-03-09 06:11:22.817	NULL	DEV2019:ABear
5E8CEB95-0072-4E7D-97D3-B9B46678FBC1	Issues	http://devsp2019/PWA/Project Site 2	C0B03147-375F-4DCA-9120-F8567DC48701	2022-03-09 06:11:22.800	NULL	DEV2019:ABear
5E8CEB95-0072-4E7D-97D3-B9B46678FBC1	Issues	http://devsp2019/PWA/Project Site 2	C0B03147-375F-4DCA-9120-F8567DC48701	2022-03-09 06:11:22.800	NULL	DEV2019:ABear
5E8CEB95-0072-4E7D-97D3-B9B46678FBC1	Issues	http://devsp2019/PWA/Project Site 2	C0B03147-375F-4DCA-9120-F8567DC48701	2022-03-09 06:11:22.800	NULL	DEV2019:ABear

Query executed successfully. DEVSP2019 (15.0 RTM) DEV2019:ABear (72) Reflex\_ReportingData 00:00:00 7 rows

## Default Field Type Mapping Rules

Reflex reporting comes with a default set of mapping rules, that determine (among other properties) the SQL field type to use for a given SharePoint field type. These are only the defaults and generally, you should change field type mappings at the field mapping level within a reporting schema. But the defaults can be changed or added to.

To change the defaults, from SharePoint Central Administration navigate to [General Application Settings]=>[Default Field Type mapping rules].



Delete	SharePoint Field Type	Reporting Schema Field Type	Multi-Column	Column Mapped	Remove Rich Text Markup
X	Single line of text	varchar(255)	False	0	False
X	Choice	varchar(255)	False	0	False
X	Multiple lines of text	ntext	False	0	False
X	Computed	varchar(255)	False	0	False
X	Person or Group	varchar(255)	True	1	False
X	Attachments	bit	False	0	False
X	Counter	varchar(255)	False	0	False
X	Date and Time	datetime	False	0	False
X	Yes/No	bit	False	0	False
X	Lookup	varchar(255)	False	0	False
X	Number	decimal(25,6)	False	0	False
X	Currency	money	False	0	False

## User Friendly Messages (Deprecated Feature)

User friendly messages is a deprecated feature, please refrain from using it. It is provided only for backward compatibility.

User friendly messages, allow you to provide a “friendly” error message to the end user of a SharePoint list if the list is mapped to a reporting schema with a SQL table that has custom SQL constraints added. The idea was to provide advanced item validation rules that could not be implemented in previous versions of SharePoint.

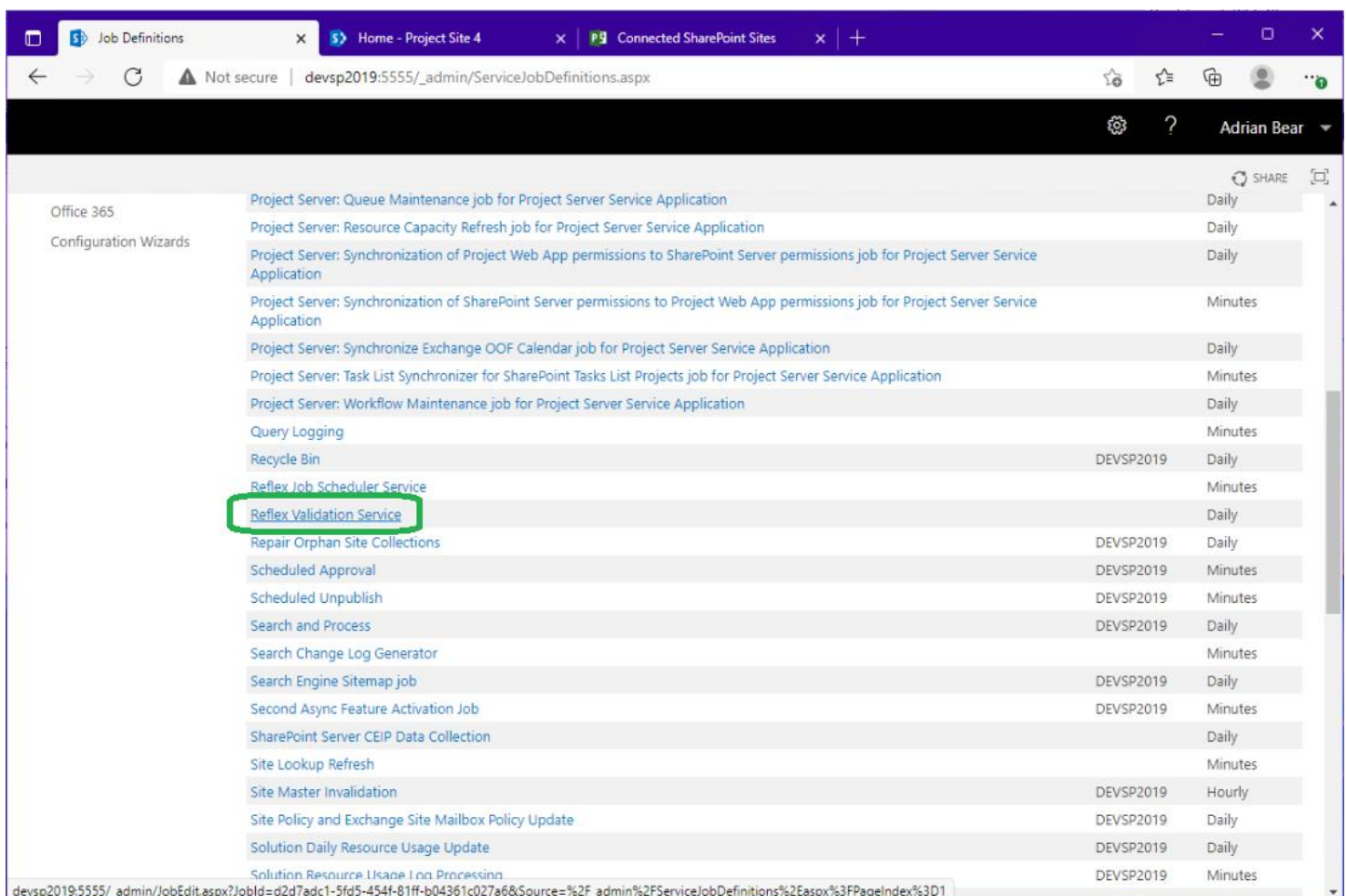
SharePoint is better now and there are better ways to achieve this.

## Trigger a Full Sync (Process All)

Reflex Reporting provides real-time reporting through hooking the SharePoint event handlers, but also provides a daily validation service job that re-processes all reporting schemas and lists.

After some maintenance tasks, reporting tables maybe left and you may not wish to wait for daily validation service to populate these tables. In this case, you can manually kick off the validation service to start the full validation and sync process immediately.

From SharePoint Central Administration navigate to [Monitoring]=>[Review Job Definitions] and search for the “Reflex validation service” job (it will likely be on the second or third page of jobs).



The screenshot shows the 'Job Definitions' page in SharePoint Central Administration. The page lists various scheduled jobs. The 'Reflex Validation Service' job is highlighted with a red box. The table below summarizes the visible jobs.

Job Name	Frequency
Project Server: Queue Maintenance job for Project Server Service Application	Daily
Project Server: Resource Capacity Refresh job for Project Server Service Application	Daily
Project Server: Synchronization of Project Web App permissions to SharePoint Server permissions job for Project Server Service Application	Daily
Project Server: Synchronization of SharePoint Server permissions to Project Web App permissions job for Project Server Service Application	Minutes
Project Server: Synchronize Exchange OOF Calendar job for Project Server Service Application	Daily
Project Server: Task List Synchronizer for SharePoint Tasks List Projects job for Project Server Service Application	Minutes
Project Server: Workflow Maintenance job for Project Server Service Application	Daily
Query Logging	Minutes
Recycle Bin	DEVSP2019 Daily
Reflex Job Scheduler Service	Minutes
<b>Reflex Validation Service</b>	Daily
Repair Orphan Site Collections	DEVSP2019 Daily
Scheduled Approval	DEVSP2019 Minutes
Scheduled Unpublish	DEVSP2019 Minutes
Search and Process	DEVSP2019 Daily
Search Change Log Generator	Minutes
Search Engine Sitemap job	DEVSP2019 Daily
Second Async Feature Activation Job	DEVSP2019 Minutes
SharePoint Server CEIP Data Collection	Daily
Site Lookup Refresh	Minutes
Site Master Invalidation	DEVSP2019 Hourly
Site Policy and Exchange Site Mailbox Policy Update	DEVSP2019 Daily
Solution Daily Resource Usage Update	DEVSP2019 Daily
Solution Resource Usage Log Processing	DEVSP2019 Minutes

Click into the job and click “Run Now”.

**\*\* NOTE \*\*** Do **NOT** make this job run more frequently than once per day. It will add too much load to your SharePoint servers. It should run after business hours.

The screenshot shows the 'Edit Timer Job' interface in a SharePoint environment. The browser address bar indicates the URL is `devsp2019:5555/_admin/JobEdit.aspx?JobId=d2d7adc1-5fd5-454f-81ff-b04361c027a6&Source=%2F_admin%2FSe...`. The user is logged in as 'Adrian Bear'. The left sidebar contains navigation links for 'Timer Links', 'Central Administration', and 'Configuration Wizards'. The main content area is titled 'Edit Timer Job' and displays the following information:

- Job Title:** Reflex Validation Service
- Job Description:** (Empty text area)
- Job Properties:** This section lists the properties for this job.
- Web application:** N/A
- Last run time:** 3/9/2022 4:24 AM
- Recurring Schedule:** Use this section to modify the schedule specifying when the timer job will run. Daily, weekly, and monthly schedules also include a window of execution. The timer service will pick a random time within this interval to begin executing the job on each applicable server. This feature is appropriate for high-load jobs which run on multiple servers on the farm. Running this type of job on all the servers simultaneously might place an unreasonable load on the farm. To specify an exact starting time, set the beginning and ending times of the interval to the same value.
- This timer job is scheduled to run:**
  - ☐ Minutes
  - ☐ Hourly
  - ☒ Daily
  - ☐ Weekly
  - ☐ Monthly
- Starting every day between:** 1 AM and 5 AM
- and no later than:** 00 and 00

At the bottom of the page, there are four buttons: 'Run Now' (highlighted with a green box), 'Disable', 'OK', and 'Cancel'.

This service will spawn Reflex Reporting Jobs, which in turn use One-time SharePoint Timer jobs to execute tasks (like reflecting all data from a list in a site). You may have to wait quite some time for all data to sync, depending on how much data you have. But even in large deployments, it should complete in less than 2 to 3 hours. Jobs run in parallel across all SharePoint application servers.

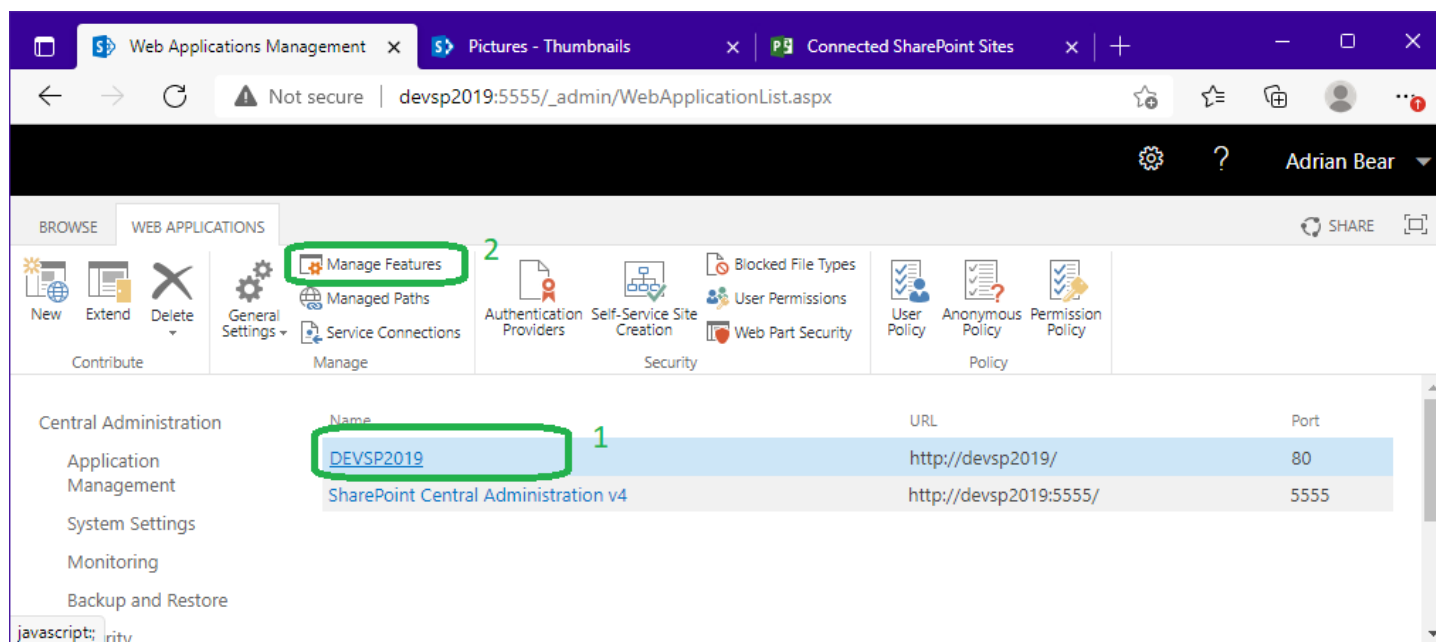


## Site Collection User Interface (SCUI)

The site collection user interface for reflex reporting is an optional component. If installed, it must also be activated both at the Web Application level (in SharePoint Central Administration by a Farm Administrator) and at the site collection level (by a Site Collection Administrator).

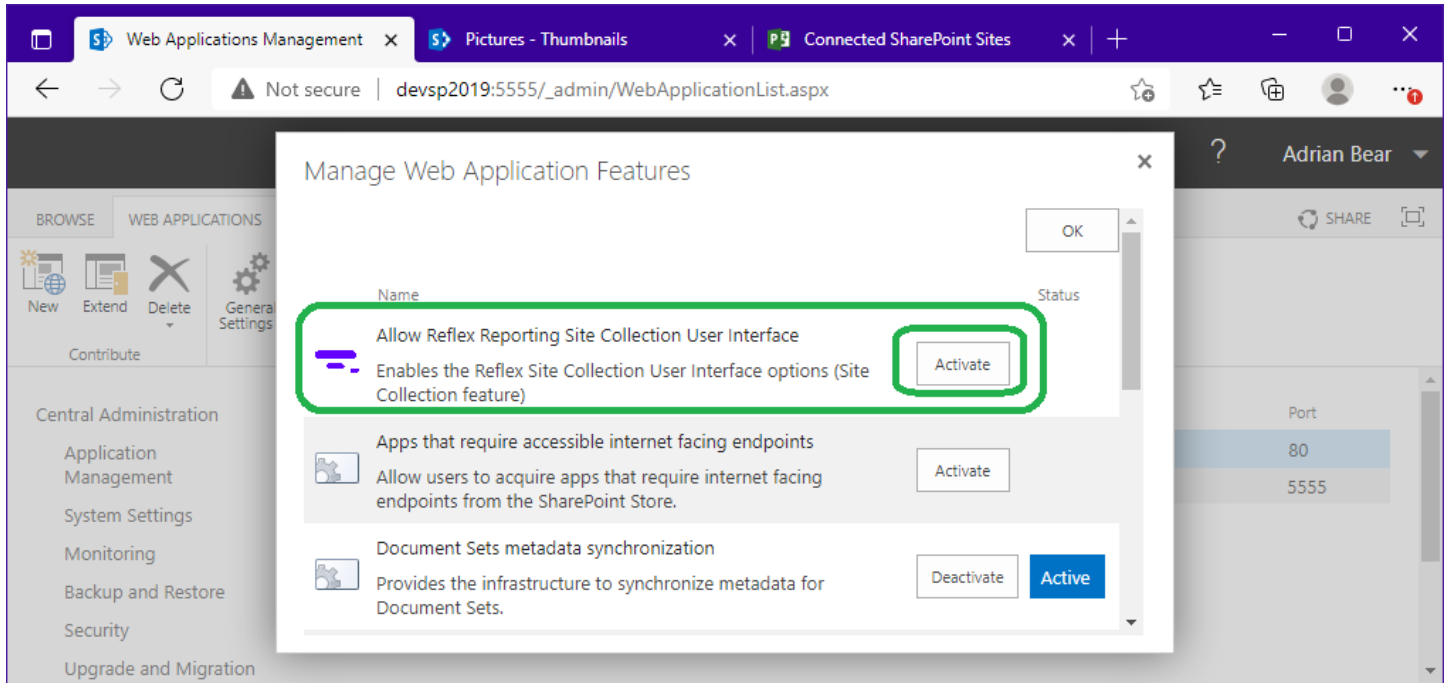
### Reflex Reporting SCUI Activation

From SharePoint Central Administration, navigate to [Application Management]>[Manage web applications] and select the web application you'd like to enable the site collection user interface in.



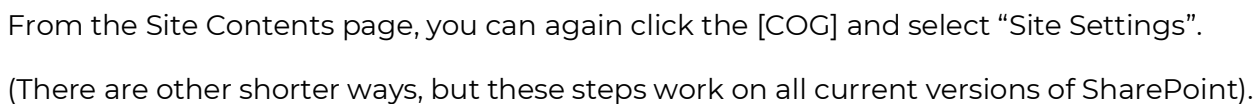
From the ribbon menu click "Manage features".

Click “Activate” on the feature “Allow Reflex Reporting Site Collection User Interface”.

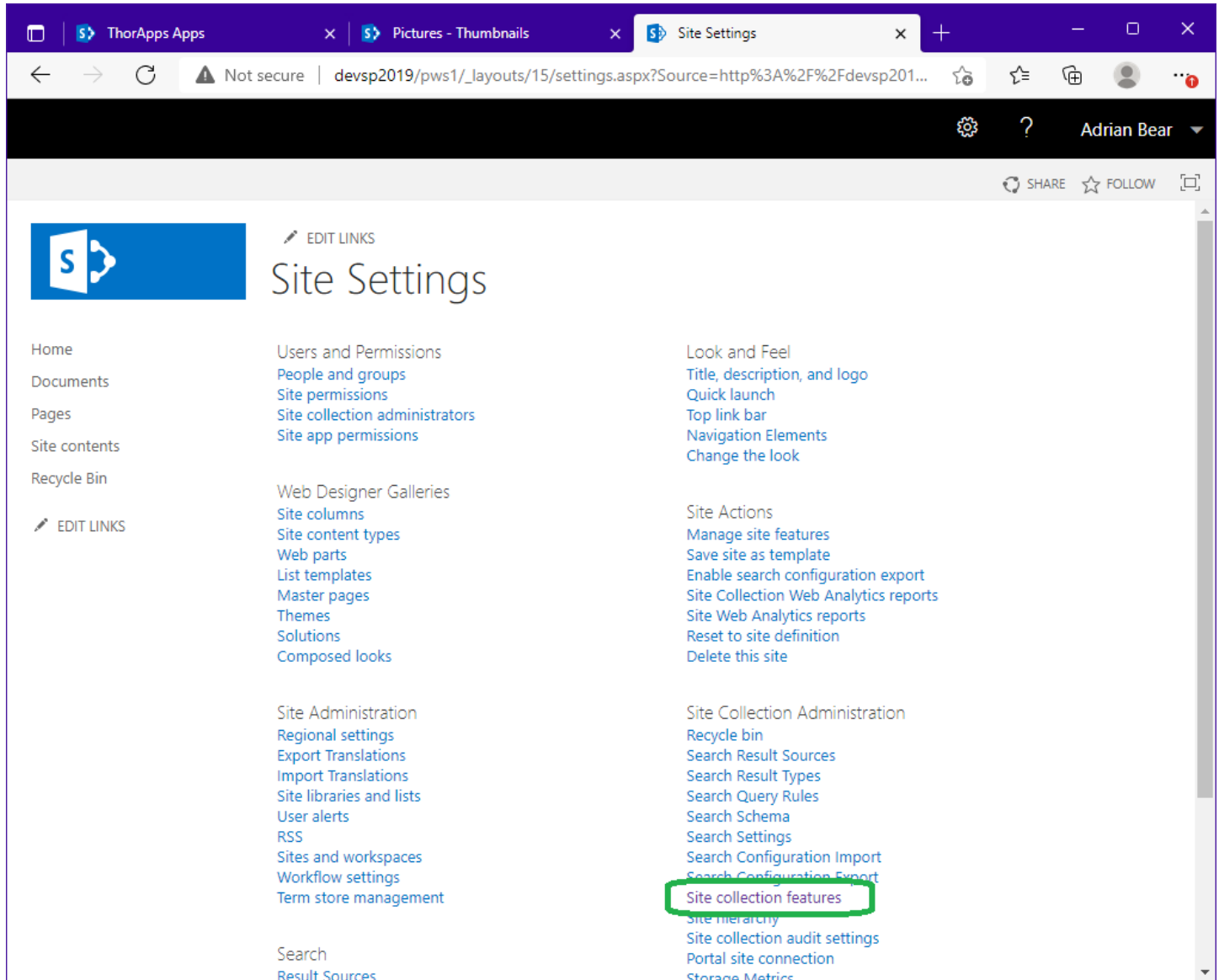


You can now close SharePoint Central Administration and open the root site of the site collection you want to enable the Reflex Reporting SCUI in.

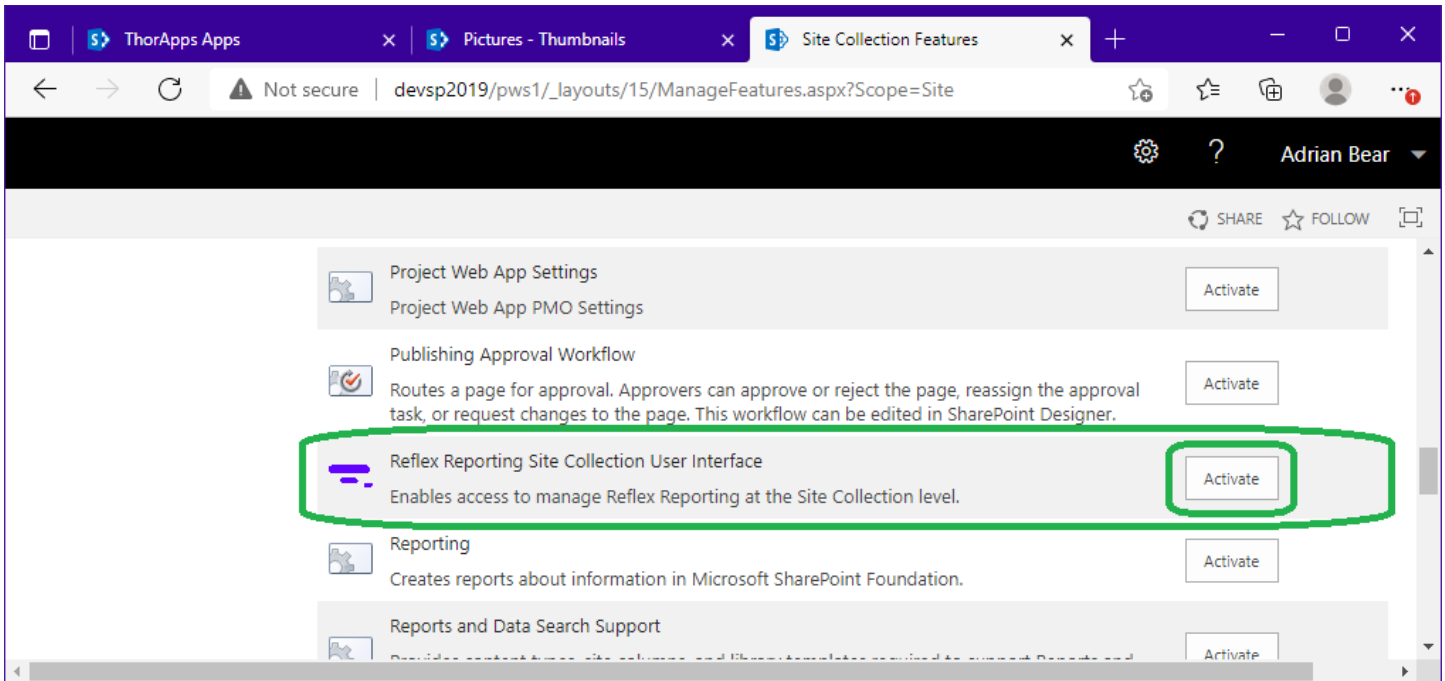
From to the Page banner click the [COG] and select "Site contents".



From the Site collections, site settings page click “Site collection features”.

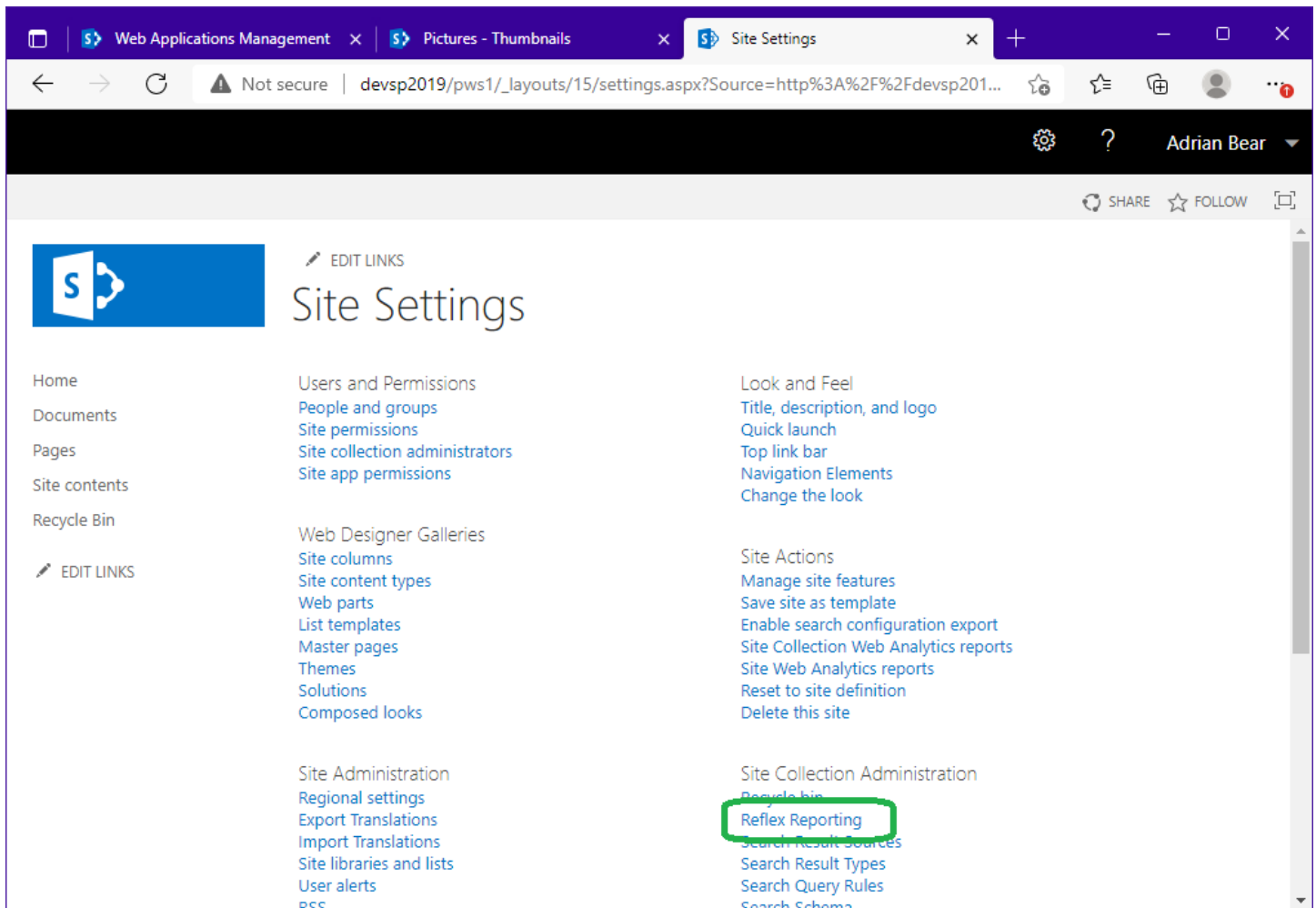


From the list of site collection features, scroll down until you find “Reflex Reporting Site Collection User Interface” and click “Activate”.



**Note:** If you get an error here about a dependant Web Application feature not being activated, it's likely you have not Activated the “Reflex Reporting Site Collection User Interface” Web Application feature first.

Once the Site collection feature “Reflex Reporting Site Collection User Interface” is activated, return to the Site Settings menu and locate the new “Reflex Reporting” menu option under “Site Collection Administration”.



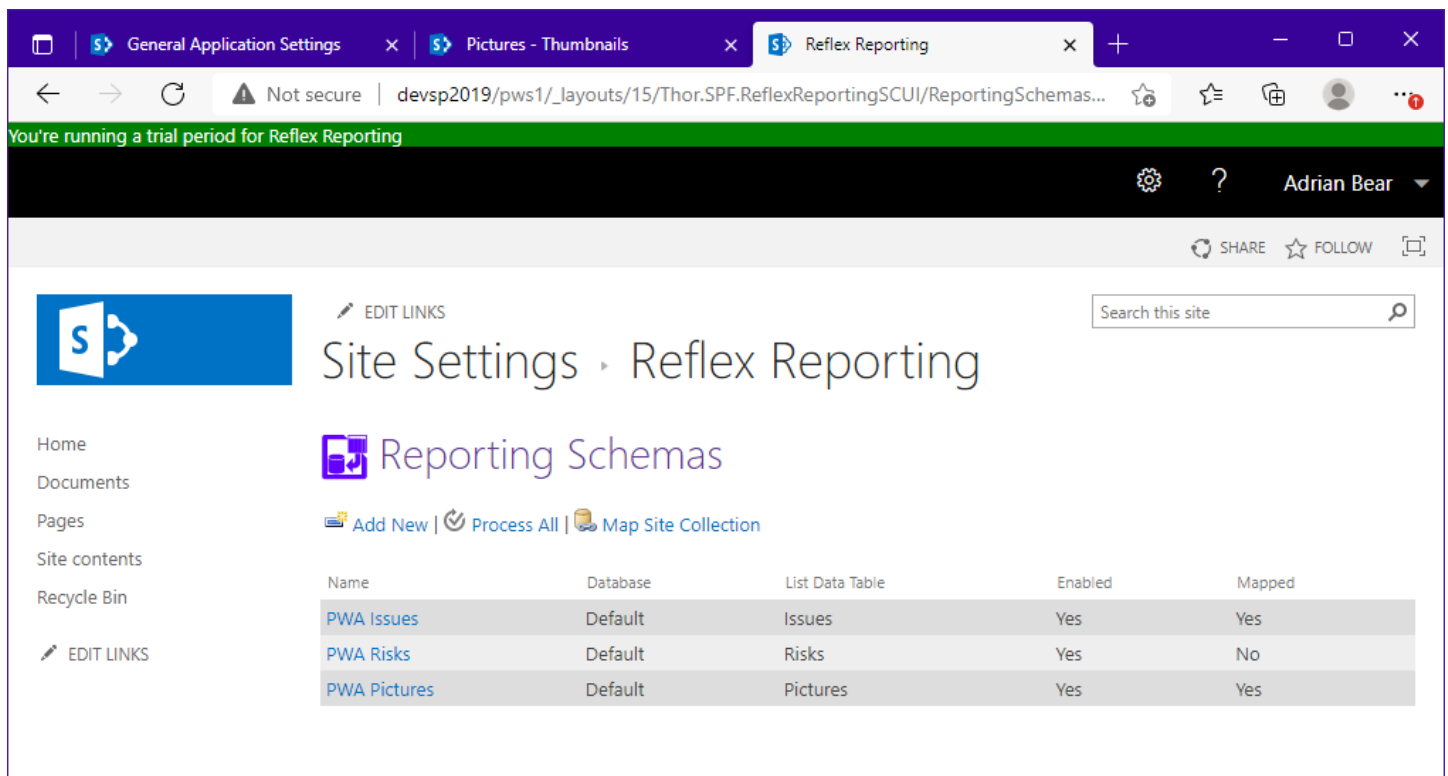
## Reporting Schemas (Site Collection User Interface)

The Reflex Reporting SCUI, provides a subset of the features provided in the Central Administration interface. The SCUI does not provide the ability to create (or delete) reporting databases. Therefore, you MUST use the Central Administration interface to create reporting databases, before the SCUI can be used. This is by design. Reporting databases should only be created by SharePoint Farm Administrator's. If you have been following this guide from the beginning, this step has already been completed. If not, to create a Reporting Database, please refer to the previous section “**Create a Reflex Reporting database**”.

To access the Reflex Reporting SCUI, you must be a Site Collection Administrator.

Changes made in the Central Administration UI are reflected in the Site Collection UI and vice versa.

Open the Reflex Reporting SCUI by clicking the Site Collection, Site Settings menu “Reflex Reporting” described in the previous section. The first page shows the list of Reporting Schemas (if any have been created).

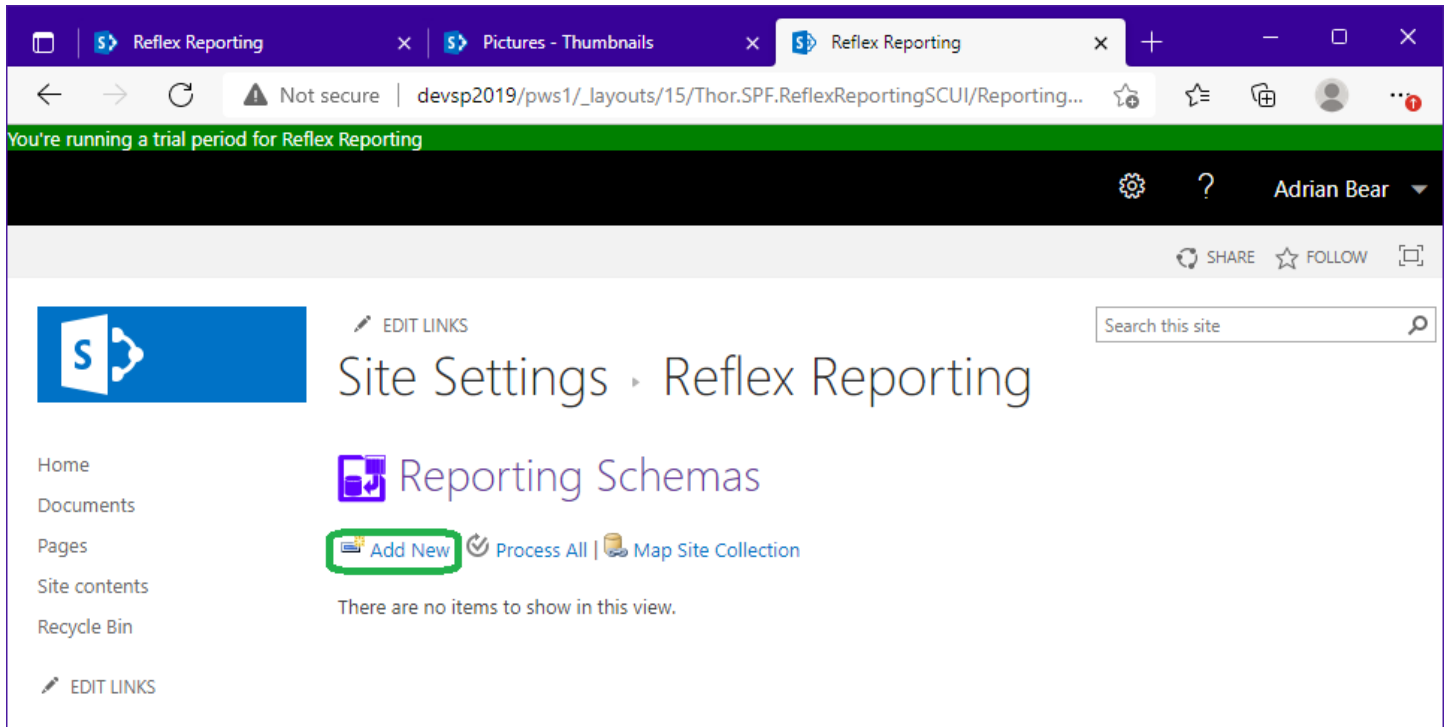


The screenshot displays the 'Reporting Schemas' page in the SharePoint Site Settings interface. The page title is 'Site Settings - Reflex Reporting'. Below the title, there are three action buttons: 'Add New', 'Process All', and 'Map Site Collection'. A table lists the existing reporting schemas with the following columns: Name, Database, List Data Table, Enabled, and Mapped.

Name	Database	List Data Table	Enabled	Mapped
<a href="#">PWA Issues</a>	Default	Issues	Yes	Yes
<a href="#">PWA Risks</a>	Default	Risks	Yes	No
<a href="#">PWA Pictures</a>	Default	Pictures	Yes	Yes

## Add a New Reporting Schema

To add a new Reporting Schema, click “Add New” on the Reporting Schemas page.





On the new reporting schema page, enter (at minimum) a “Display Name” for the reporting schema and choose the list used to source fields. Note, the “Web Site” and “List” dropdown boxes are chained together, so after selecting a “Web Site” you need to wait for it to populate the “List” dropdown.

**New Reporting Schema**

Save

Display Name: PWA Issues **1**

Reporting Database: Default **2**

Web Site: /pws1/Project Site 4 **3**

List: Issues **4**

SQL Table Name: Issues **5**

Include File Contents: ☐ **6**

List Management: ☒ All lists with this Title across the site collection  
☐ Just this single list instance in this Web

**Chained dropdown boxes, wait for population**

SP Field Name	SP Internal Name	SP Field Type	SQL Field Name
Title	Title	Single line of text	Title
Modified	Modified	Date and Time	Modified
Created	Created	Date and Time	Created
Created By	Author	Person or Group	Created By
Modified By	Editor	Person or Group	Modified By
Compliance Asset Id	ComplianceAssetId	Single line of text	Compliance Asset Id
Owner	Owner	Person or Group	Owner
Assigned To	AssignedTo	Person or Group	Assigned To

The “Reporting Database” allows you to choose which reporting database the reporting schema will create a SQL table in.

The “SQL Table Name” field is defaulted based on the list name selected, but you can change it.

The “Include File Contents” checkbox is used when a “Document Library” is selected and you wish to extract the binary contents of the document (i.e., most useful for picture libraries).

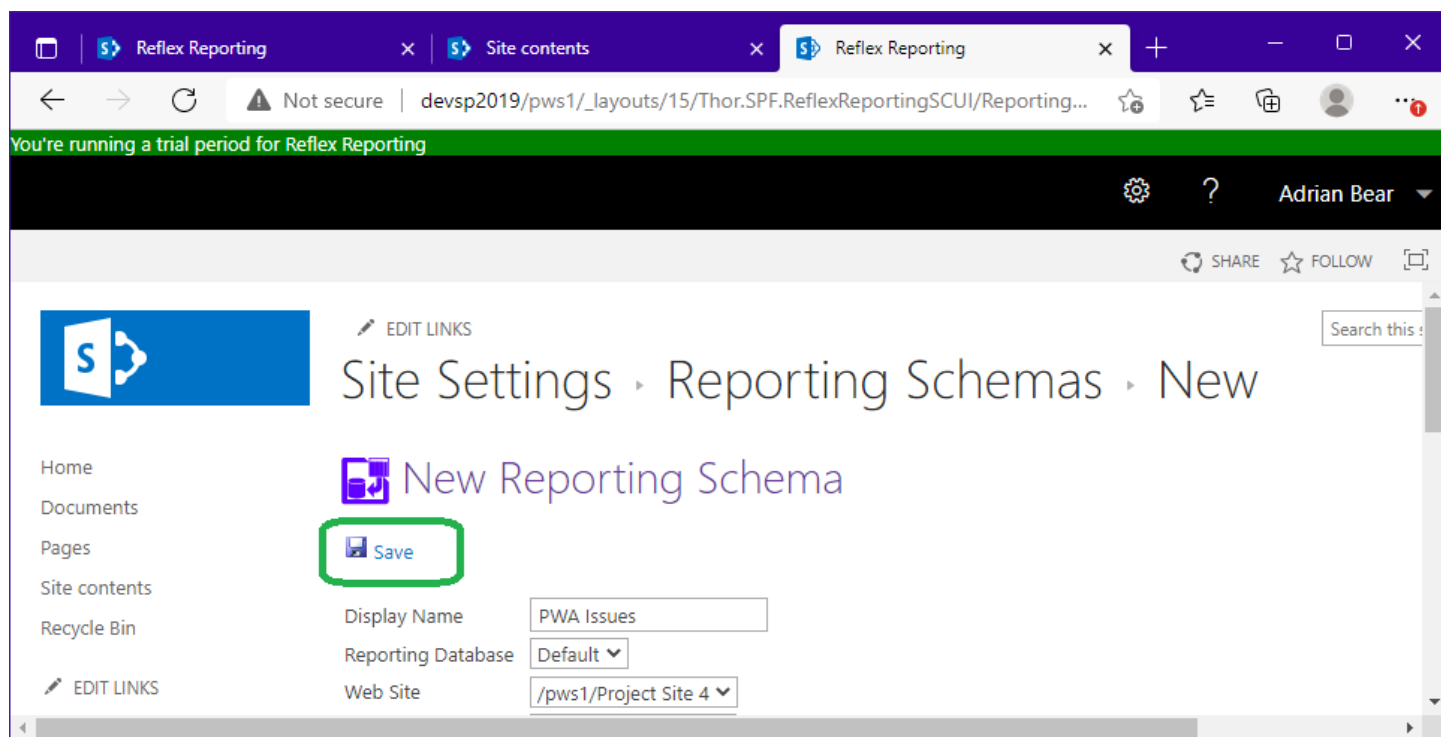
The “List Management” field is not a property of the “Reporting Schema” itself, but controls how to automatically create list mappings when you click “Save”.

If you select “All lists with this Title across the site collection”, a mapping will be created for all lists with the same ‘Title’ (or list name) as the selected list for all sites within the site collection, including any new sites that contain a list with the same Title. This is the most common use case.

If you select “Just this single list instance in this web”, a mapping will be created only for the list instance selected. No other list will be mapped to the reporting schema.

The table at the bottom of the page shows the default list of fields that will be mapped. You do not have the opportunity to change these fields yet, but you can on the next page.

Click “Save”.

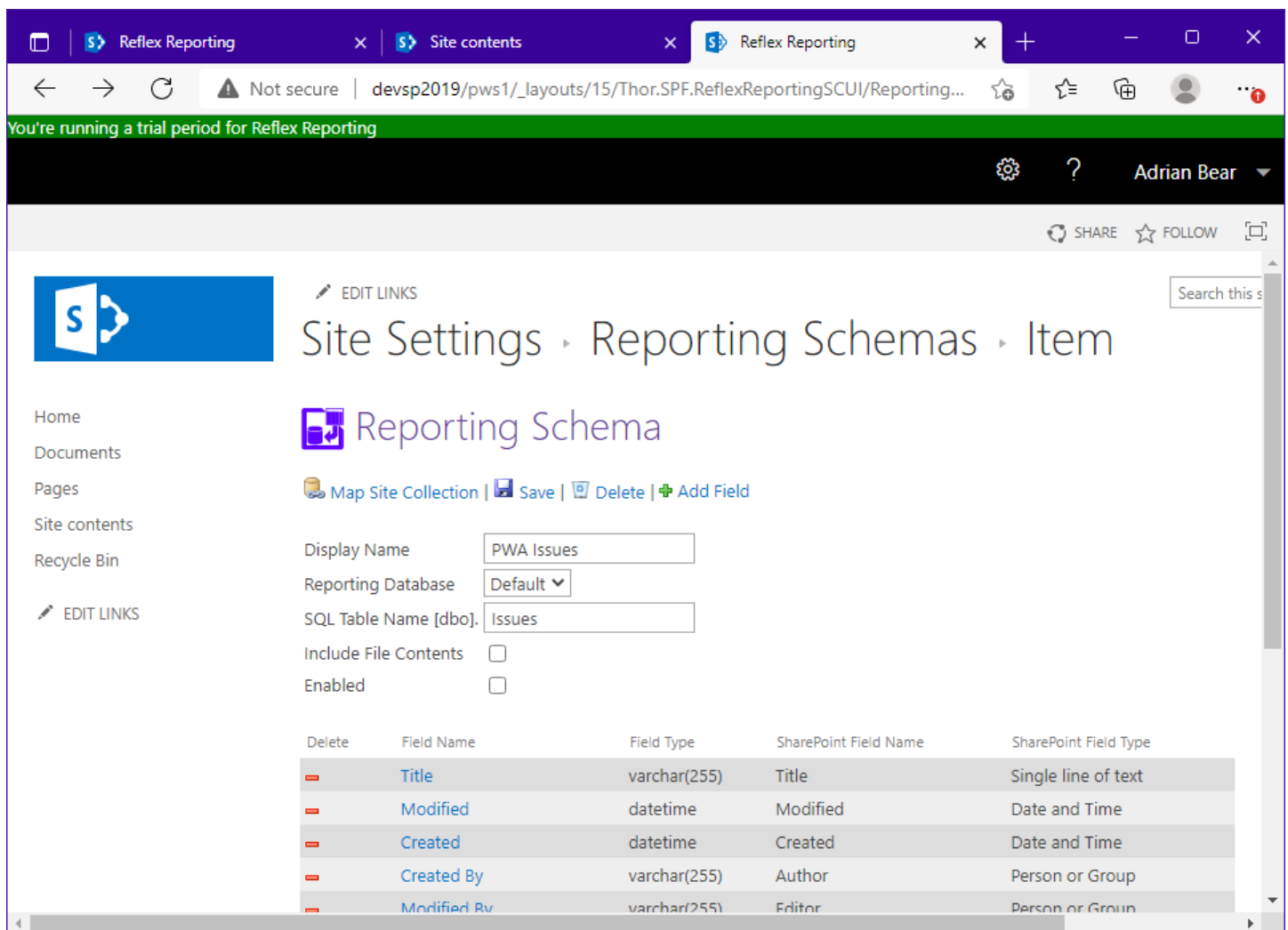


**NOTE:** Saving the new Reporting Schema, will **NOT** enable it.

## Edit a Reporting Schema

You can access the Reporting Schema edit page, either after creating a new Reporting Schema, or by clicking a Reporting Schema name in the Reporting Schemas list page.

**WARNING:** A new reporting schema is created in a disabled state, ready for you to edit it, but an existing Reporting Schema may be “Enabled” already and therefore “Locked”. If you “Disable” (uncheck the enable box), **it will DROP the related SQL table** from a reporting database. This **will break any report** attached to it.



Site Settings › Reporting Schemas › Item

### Reporting Schema

Map Site Collection | Save | Delete | Add Field

Display Name: PWA Issues

Reporting Database: Default

SQL Table Name [dbo.]: Issues

Include File Contents: ☐

Enabled: ☐

Delete	Field Name	Field Type	SharePoint Field Name	SharePoint Field Type
	Title	varchar(255)	Title	Single line of text
	Modified	datetime	Modified	Date and Time
	Created	datetime	Created	Date and Time
	Created By	varchar(255)	Author	Person or Group
	Modified By	varchar(255)	Editor	Person or Group

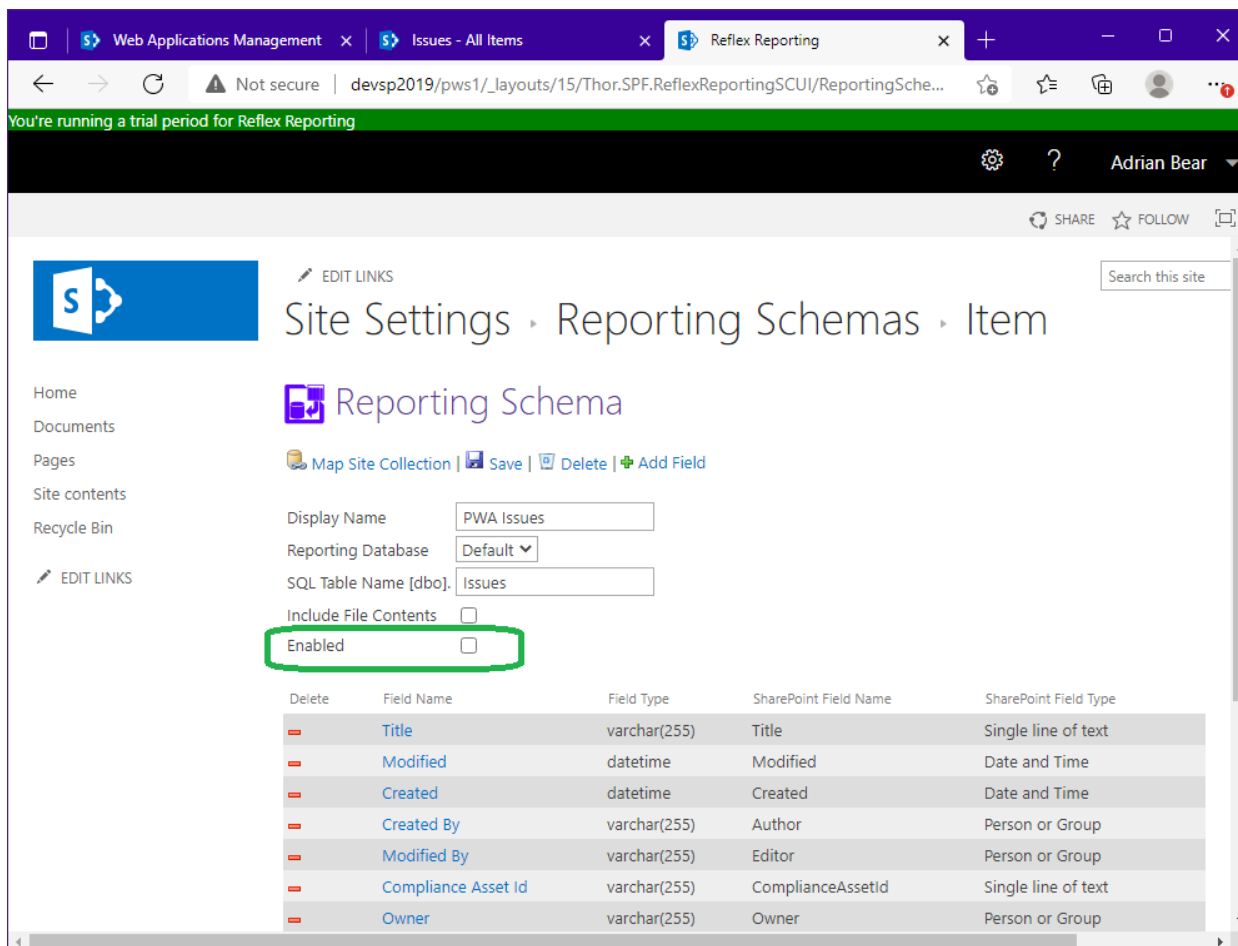
From the Reporting Schema edit page, you can remove fields (with the red minus icon), add fields (with the green plus button), delete the Reporting Schema entirely or save it.

## Enable a Reporting Schema

Once you're happy with your Reporting Schema design, you need to "Enable" it. Clicking the "Enable" checkbox, will ...

1. Save the Reporting Schema in its current state
2. Lock the Reporting Schema from edit
3. Create a SQL Table in a Reporting Database
4. Automatically trigger a "Process Now" background job (or set of jobs) to sync/reflect the mapped list data into the SQL table

Click "Enable" now and wait a few minutes for the background jobs to get underway.



The screenshot shows the 'Reporting Schema' configuration page in SharePoint. The 'Enabled' checkbox is highlighted with a green box. The page displays the following configuration details:

- Display Name: PWA Issues
- Reporting Database: Default
- SQL Table Name [dbo]: Issues
- Include File Contents: ☐
- Enabled: ☒

Delete	Field Name	Field Type	SharePoint Field Name	SharePoint Field Type
	Title	varchar(255)	Title	Single line of text
	Modified	datetime	Modified	Date and Time
	Created	datetime	Created	Date and Time
	Created By	varchar(255)	Author	Person or Group
	Modified By	varchar(255)	Editor	Person or Group
	Compliance Asset Id	varchar(255)	ComplianceAssetId	Single line of text
	Owner	varchar(255)	Owner	Person or Group

## Process Now

On a locked (enabled) Reporting Schema page a “Process Now” button is available. This button can be used to manually trigger the background jobs to resync/reflect all list instance data mapped to the Reporting Schema. Please do **NOT** click it repeatedly, it will only create more jobs and take longer to process.

## Process All

The “Reporting Schemas” page has a “Process All” button. This button is used to manually trigger a resync/reflect of all Reporting Schema’s across all site collections. This is helpful when Reflex Reporting has been installed into an environment with existing content that has not yet been extracted and you don’t want to wait for the nightly sync service.

## Map Site Collection

The “Reporting Schema” page (editable or not) has a “Map Site Collection” button. This button is used when the Reporting Schema is not mapped to any list in the current site collection. Usually, it’s already been mapped to another site collection. By clicking the “Map Site Collection” button, an existing site collection mapping is used to create a similar mapping for the current site collection.

The “Reporting Schemas” page also has a “Map Site Collection” button that performs the same function, except for all Reporting Schemas.

## Uninstall/Rollback

Removing or rolling back a Reflex Reporting installation has several steps depending on what stage of install and deployment you reached before deciding to remove or rollback.

In general, the removal process is just the reverse of installation process.

1. Deactivate the site collection feature in all site collections it has been activated in.
2. Deactivate the web application feature in all web applications it has been activated in.
3. Deactivate the farm feature.
4. Retract the farm solutions (if installed).
5. Remove the farm solutions (if installed).
6. Delete all Reflex Reporting config/schema and reporting databases.
7. Run the supplied PowerShell script to remove the Reflex Reporting event handlers from list and web instances in all site collections that were configured.
8. Optional, Retract and remove the ThorApps License Manager

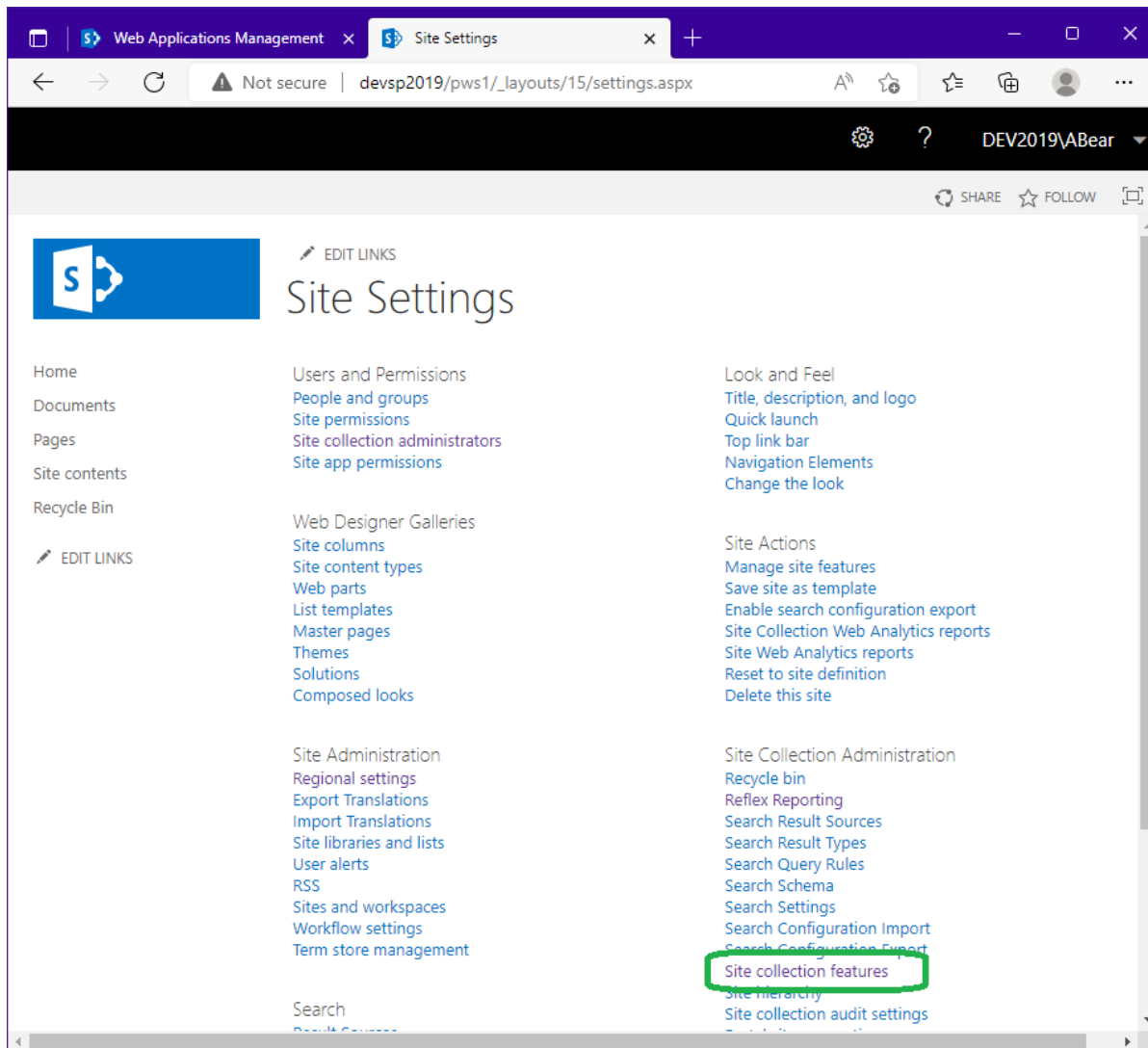
### Important notes before starting removal:

1. If other ThorApps products are installed, **do not** remove the ThorApps License Manager. If you need to remove the License Manager as part of a full remove/rollback, please ensure all other ThorApps Products are removed, before removing the ThorApps License Manager.
2. Reflex Reporting Web features (i.e., not site collection features) are used to add event receivers to specific sites. Deactivating them does not remove the event receivers and therefore it is not required to go through every sub-site to deactivate these features.  
The event receivers are removed via the PowerShell script (in step 7 above) if required.
3. **Before** starting removal process for Reflex Reporting, make sure you know the names and locations of the SQL databases used by Reflex Reporting. These can be found in the Reflex Reporting databases list under SharePoint Central Administration=>[General Application Settings]=>[Reflex databases]

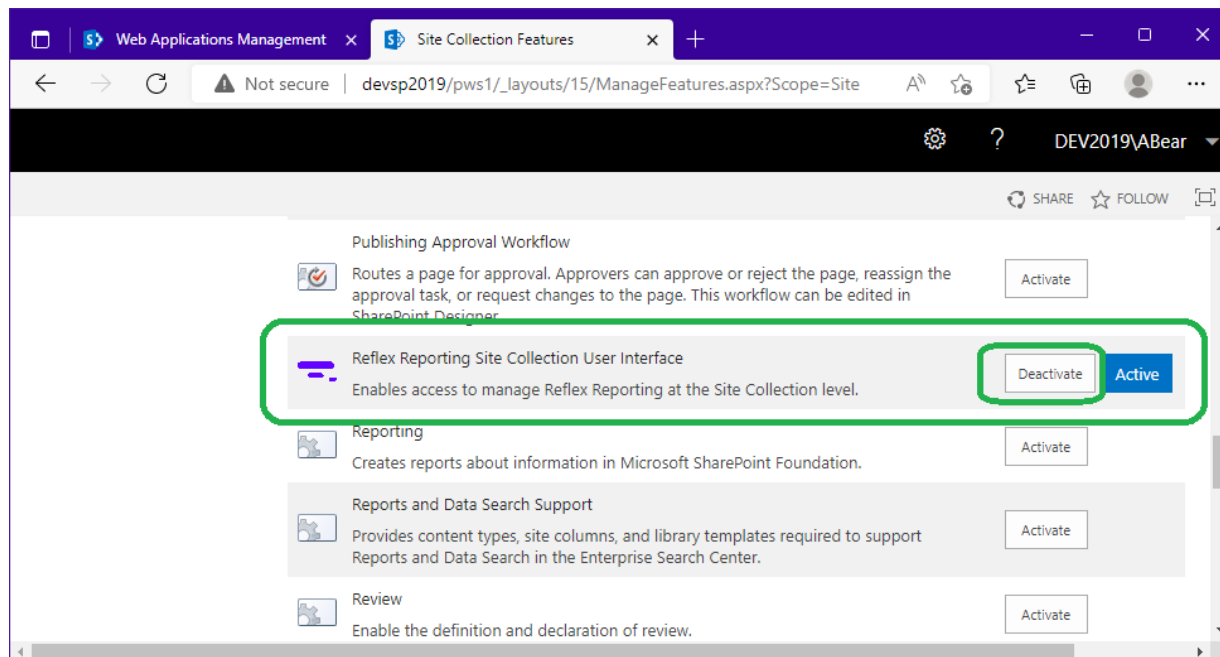
## Deactivate Site Collection feature

If you have installed the Site Collection User Interface, you'll need to deactivate the site collection level feature to remove the site settings menu item for Reflex Reporting. Note, this step is NOT required if the site collection user interface solution was never installed and activated.

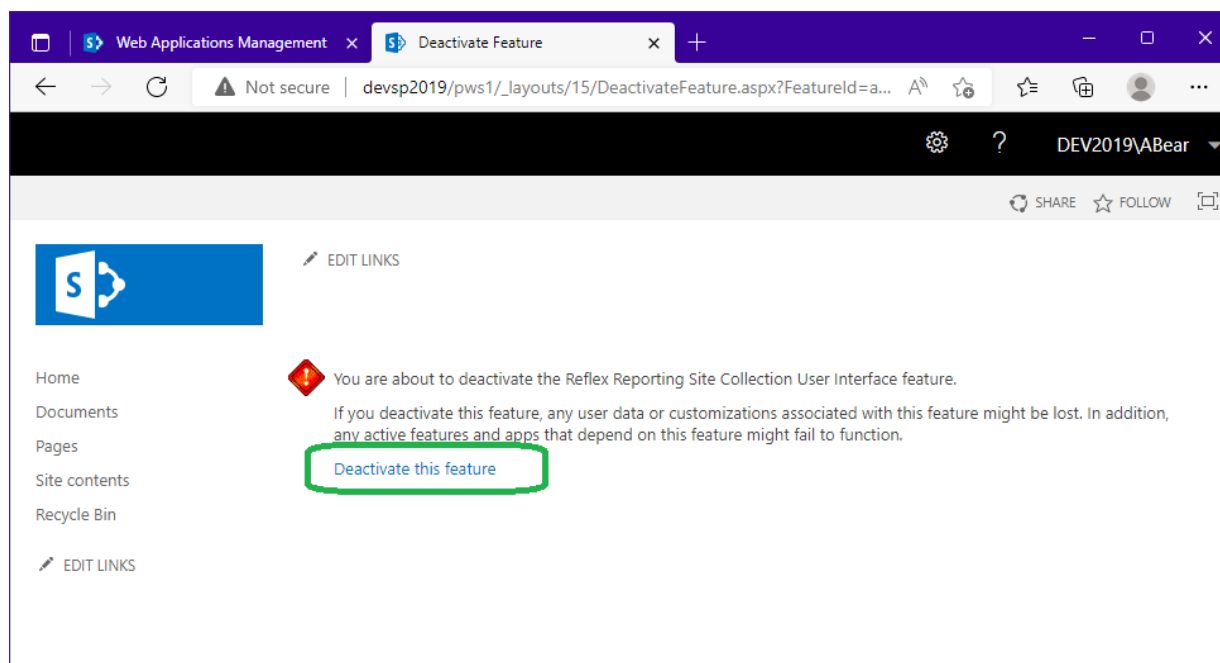
From the site collections, site settings page click "Site collection features".



Scroll down to find the feature “Reflex Reporting Site Collection User Interface” and click “Deactivate”.



You'll be prompted to confirm the deactivation. Click “Deactivate this feature”.





## Deactivate Web Application feature

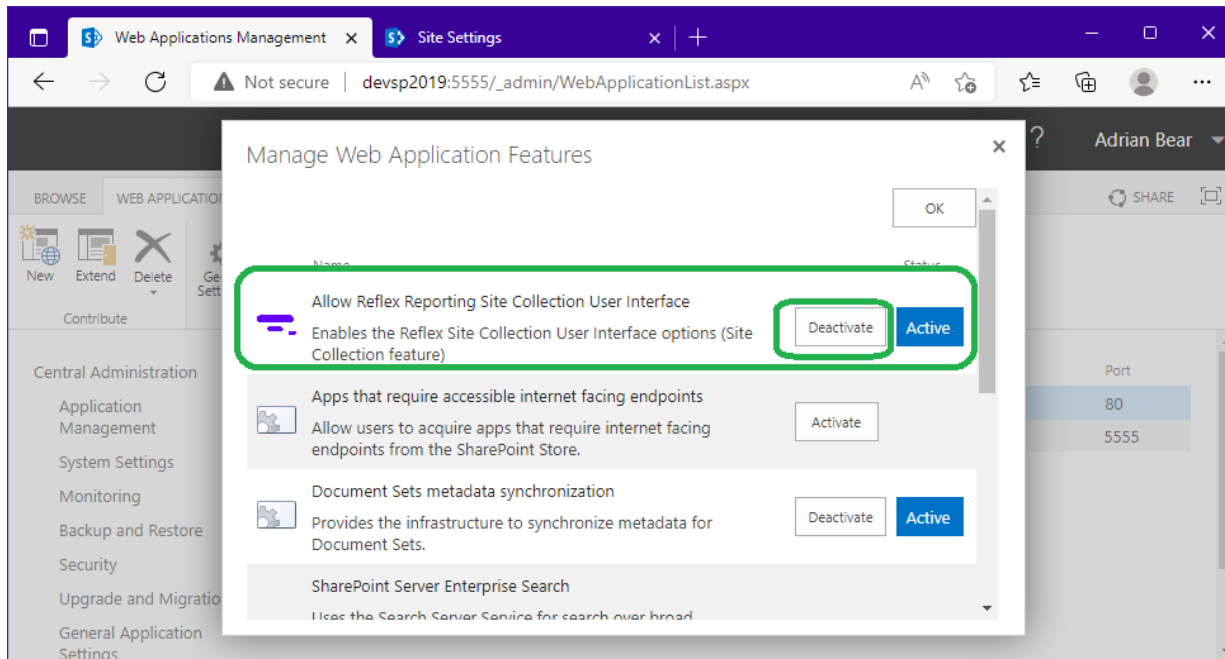
If the site collection user interface for was installed, you will also need to deactivate the web application feature.

From SharePoint Central Administration, navigate to [Application Management]=> [Manage we applications] and select the web application you enabled the site collection user interface in and click “Manage Features”.

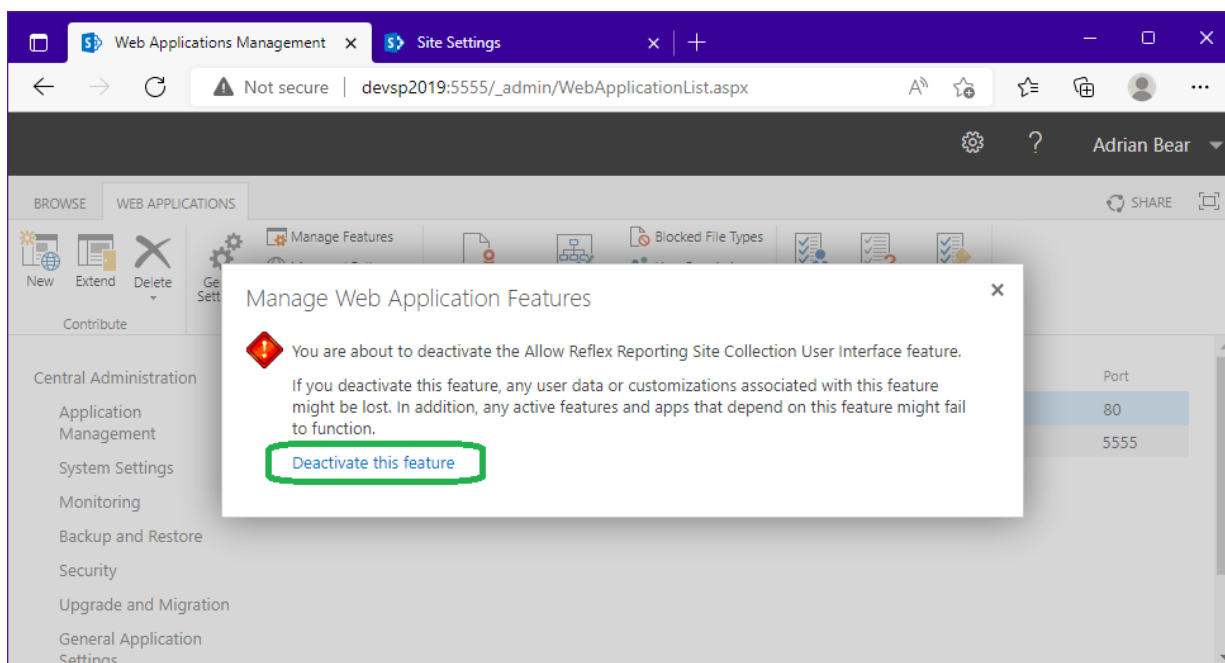
The screenshot shows the SharePoint Central Administration interface. The top navigation bar includes 'Web Applications Management' and 'Site Settings'. The main content area is titled 'WEB APPLICATIONS' and contains a table of web applications. The 'Manage Features' link is highlighted with a green box and a '2'. The 'DEVSP2019' web application is selected in the table, also highlighted with a green box and a '1'.

Name	URL	Port
DEVSP2019	http://devsp2019/	80
SharePoint Central Administration v4	http://devsp2019:5555/	5555

Locate the feature “Allow Reflex Reporting Site Collection User Interface” and click “Deactivate”.

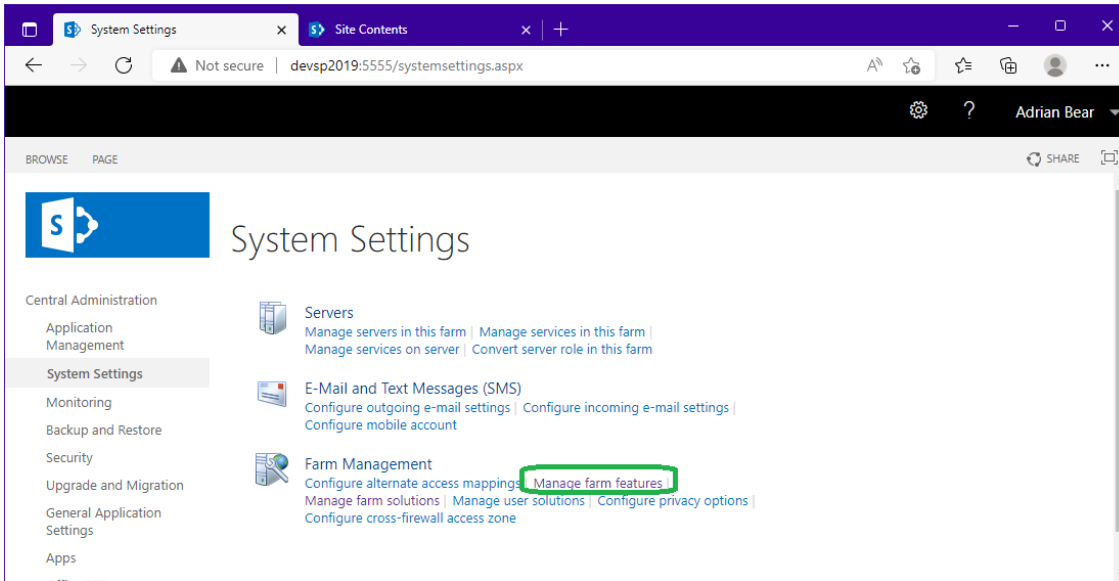


On the confirmation dialog click “Deactivate this feature”.

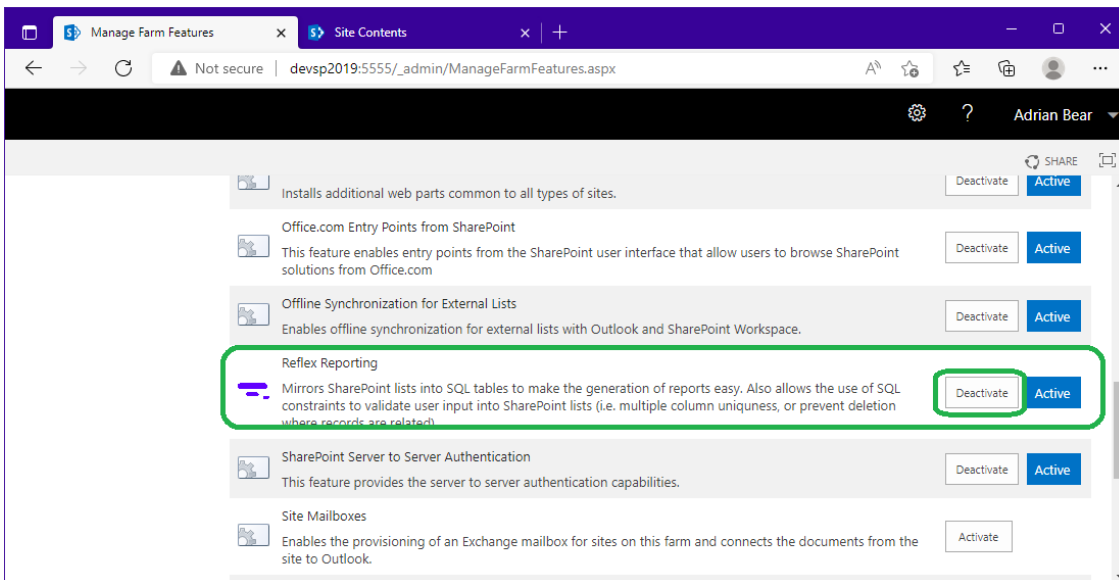


## Deactivate Farm feature

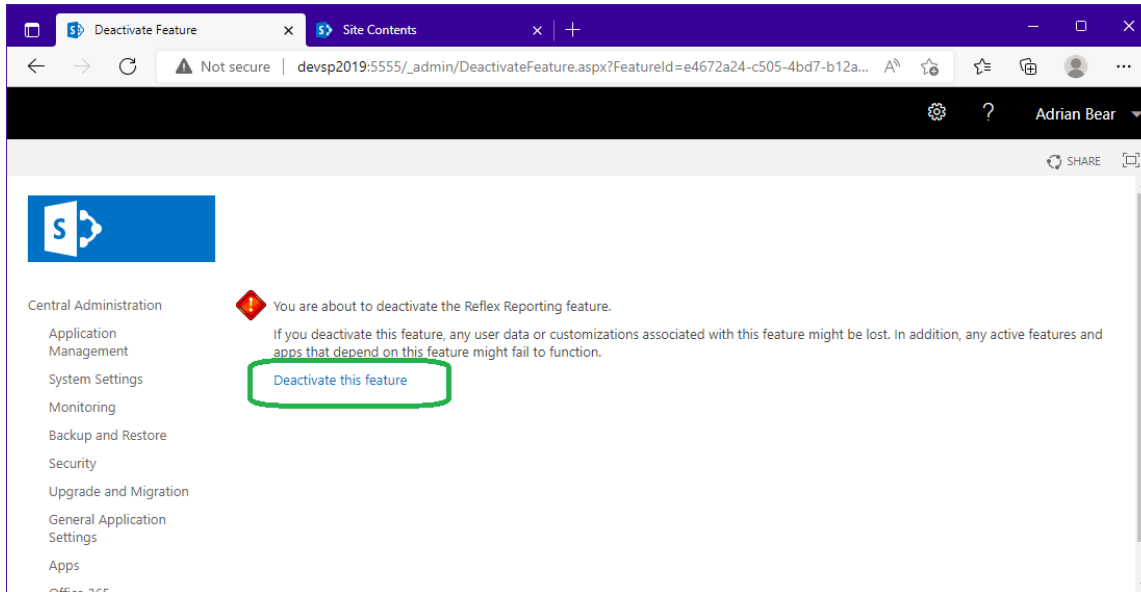
When installing Reflex Reporting, a SharePoint farm feature is automatically activated. You need to deactivate this feature by navigating to SharePoint Central Administration=>[System Settings]>[Manage farm features]



Scroll through and find the feature “Reflex Reporting” and click “Deactivate”.



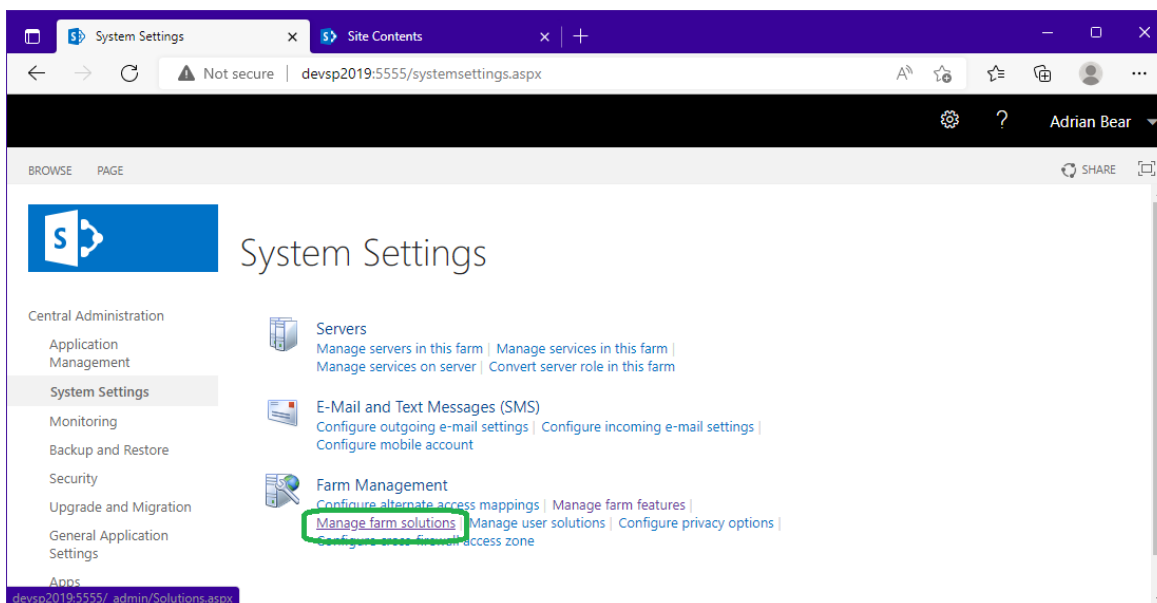
On the confirmation dialog click “Deactivate this feature”.



This will remove the Reflex Reporting menu items from SharePoint Central Administration.

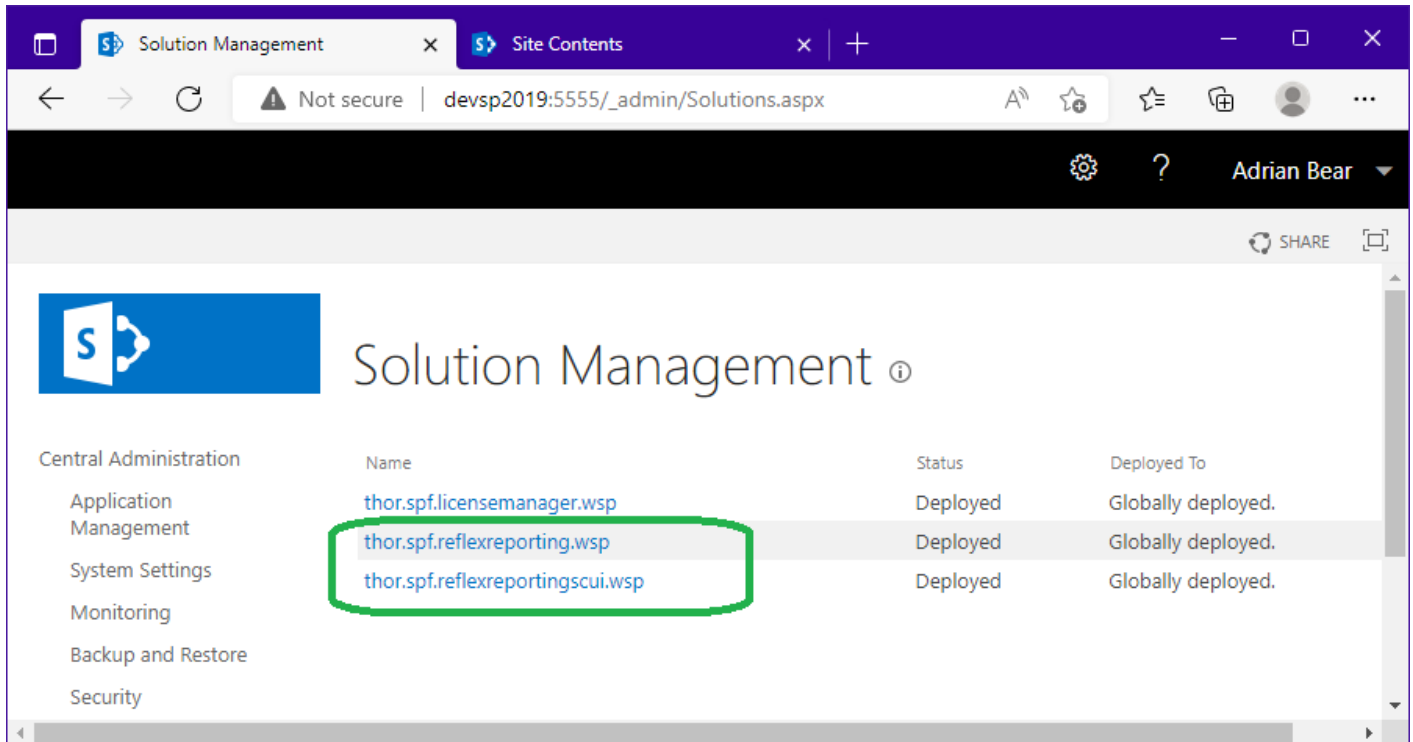
## Retract Farm solution

From SharePoint Central Administration navigate to [System Settings]=>[Manage farm solutions].



This next step needs to be repeated for both “thor.spf.reflexreporting.wsp” and “thor.spf.reflexreportingscui.wsp”, if the latter is installed. If “thor.spf.reflexreportingscui.wsp” is installed, start with it first.

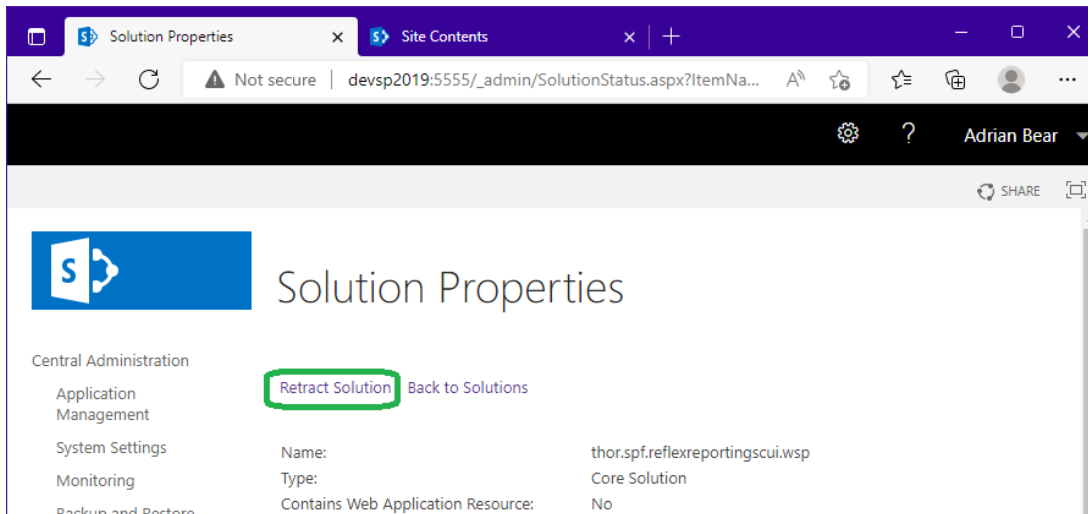
Click the name of a Reflex Reporting wsp solution.



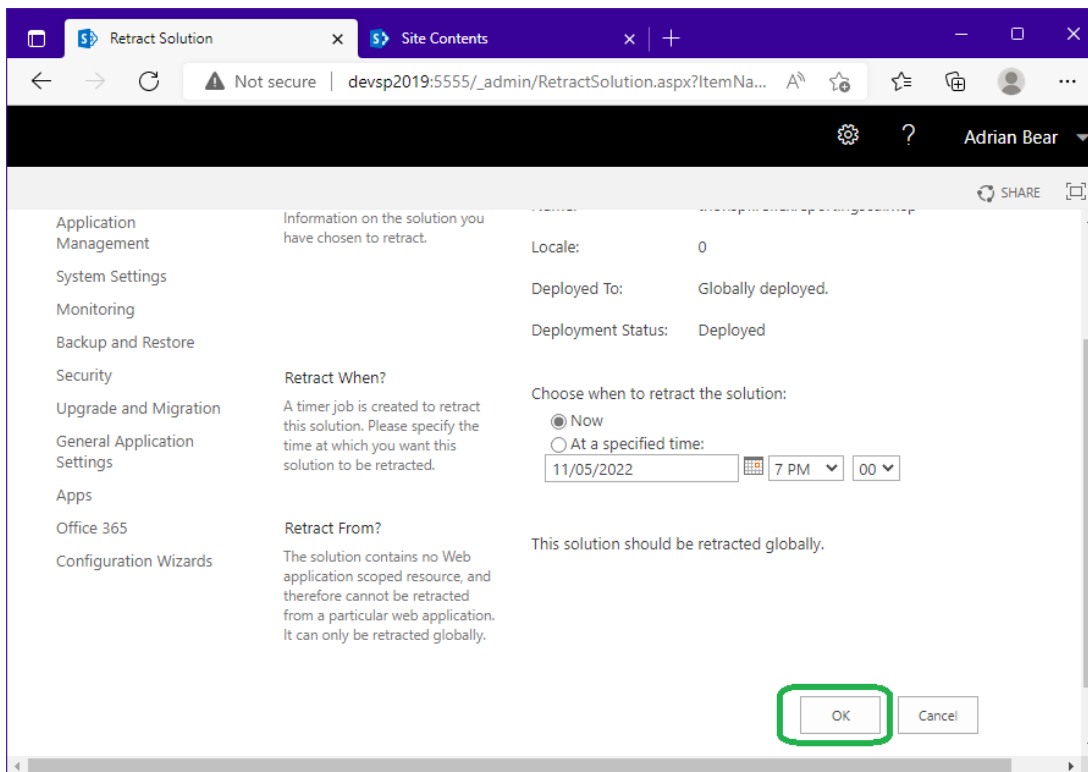
The screenshot shows the SharePoint Solution Management interface. The browser address bar indicates the URL is `devsp2019:5555/_admin/Solutions.aspx`. The user is logged in as Adrian Bear. The main content area displays a table of installed solutions. The row for `thor.spf.reflexreporting.wsp` is highlighted with a green box.

Central Administration	Name	Status	Deployed To
Application Management	<a href="#">thor.spf.licensemanager.wsp</a>	Deployed	Globally deployed.
System Settings	<a href="#">thor.spf.reflexreporting.wsp</a>	Deployed	Globally deployed.
Monitoring	<a href="#">thor.spf.reflexreportingscui.wsp</a>	Deployed	Globally deployed.
Backup and Restore			
Security			

Click “Retract Solution”.



On the schedule retraction dialog scroll to the bottom and click “OK”.

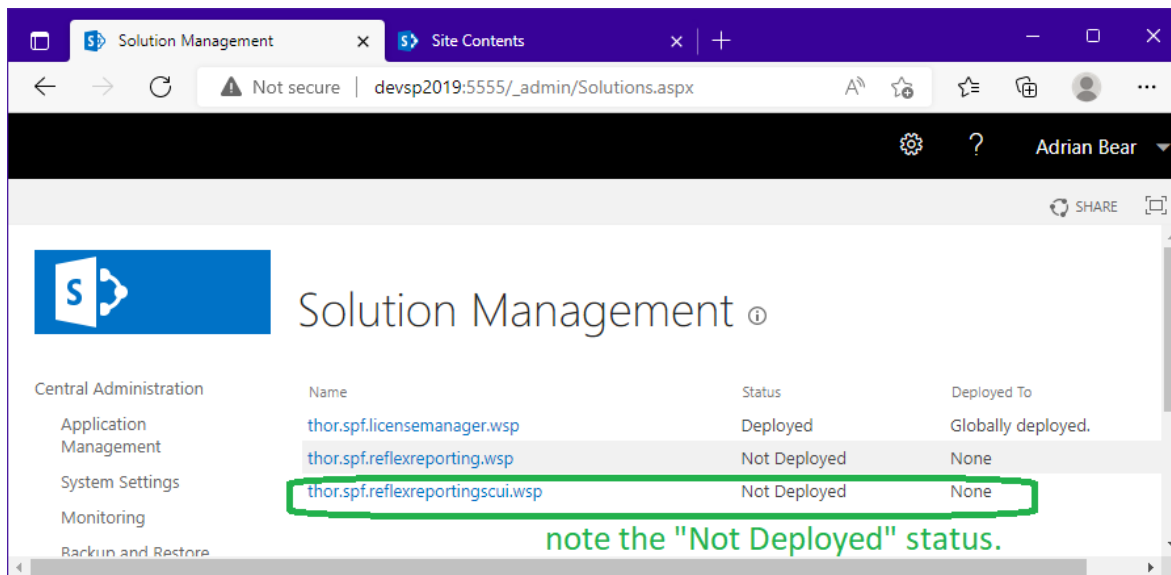


Repeat for “thor.spf.reflexreporting.wsp” and wait for both jobs to complete.

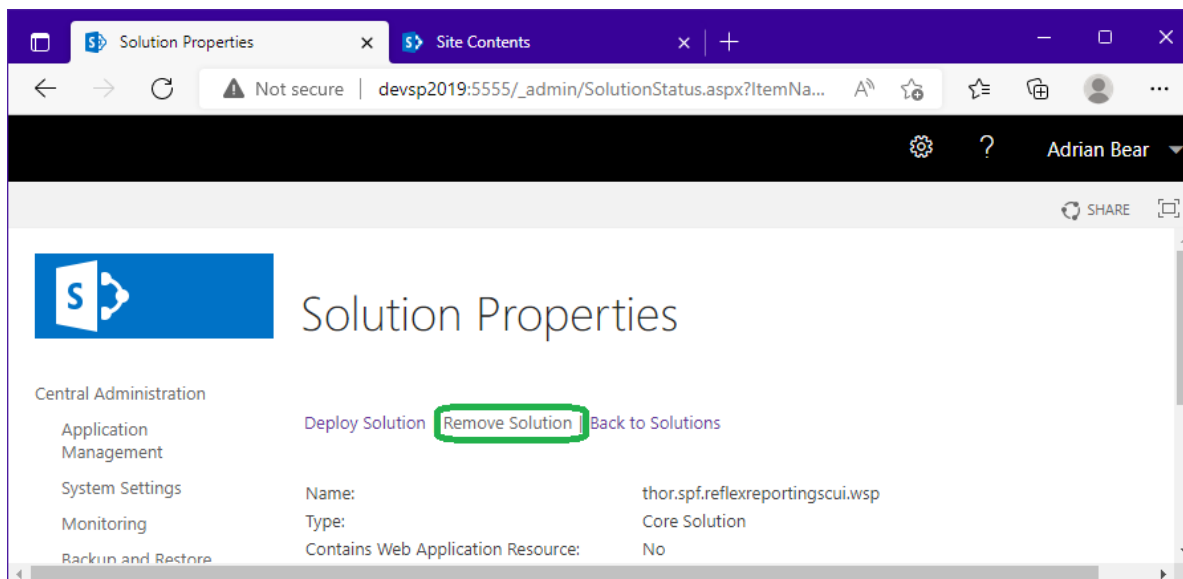
## Remove Farm Solution

This next step also needs to be repeated for both “thor.spf.reflexreporting.wsp” and “thor.spf.reflexreportingscui.wsp”. The order of removal is not important for this step.

From the Solution Management page, click the Name of a reflex reporting solution.

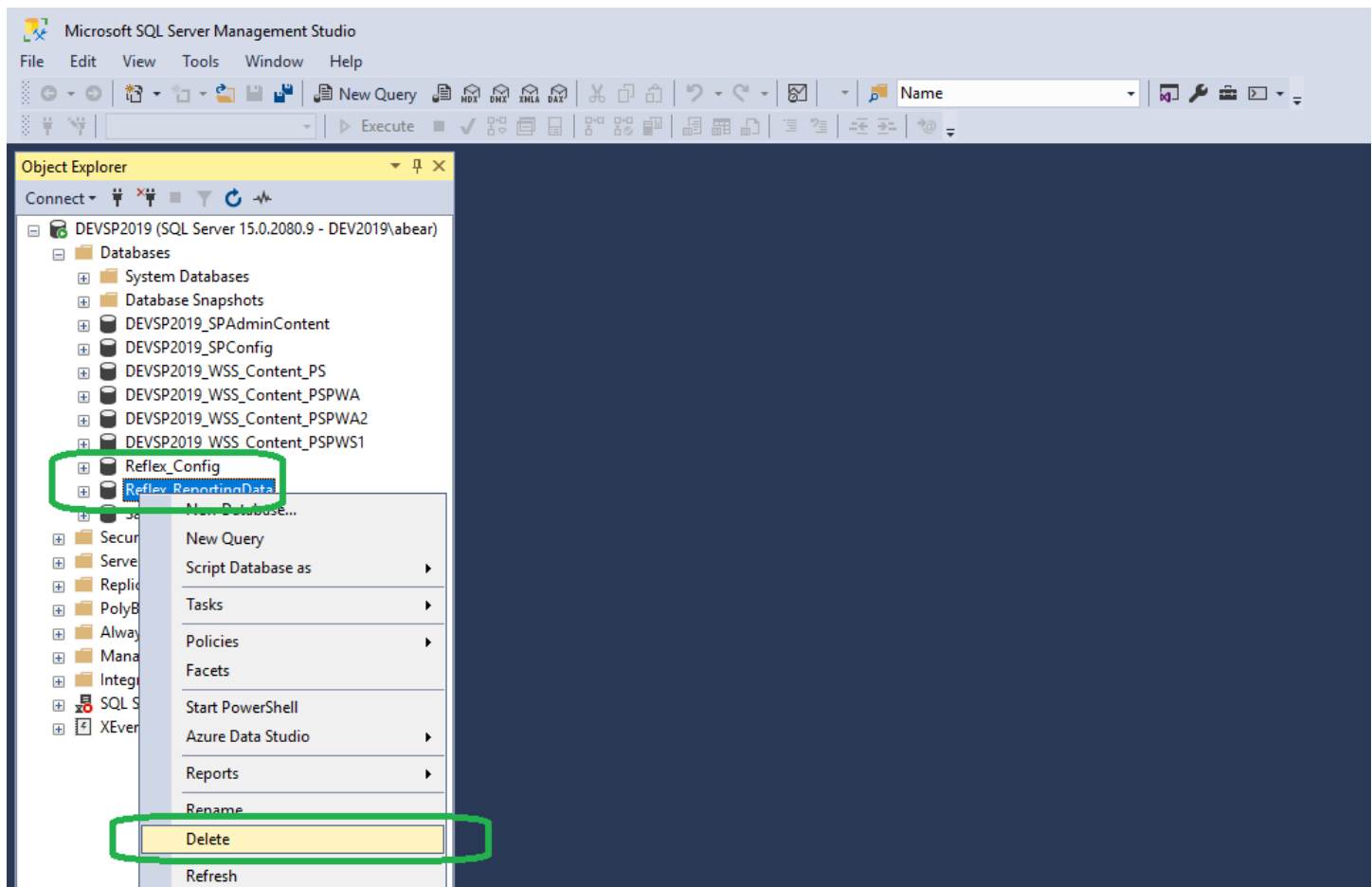


Click “Remove Solution”.



## Delete Databases

When removing Reflex Reporting from SharePoint, any databases created will not be removed. Therefore, you need to remove them manually. We recommend using SQL Server Management Studio (SSMS) from anywhere that has access, with any account that has access, to delete the list of databases you identified before starting the removal process.



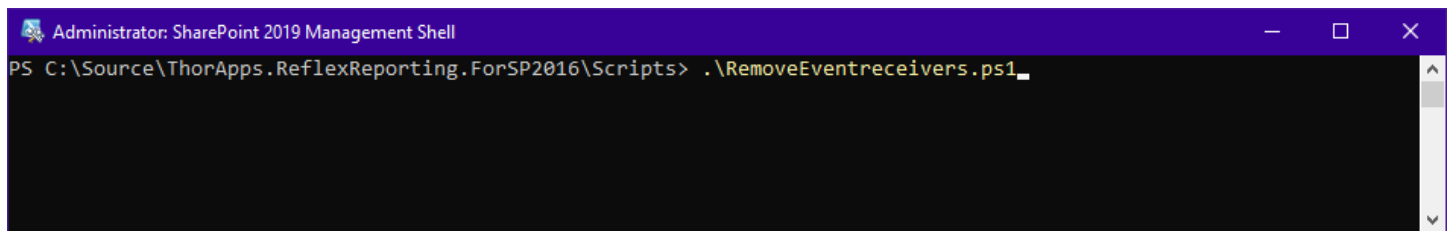


## Remove Event Receivers

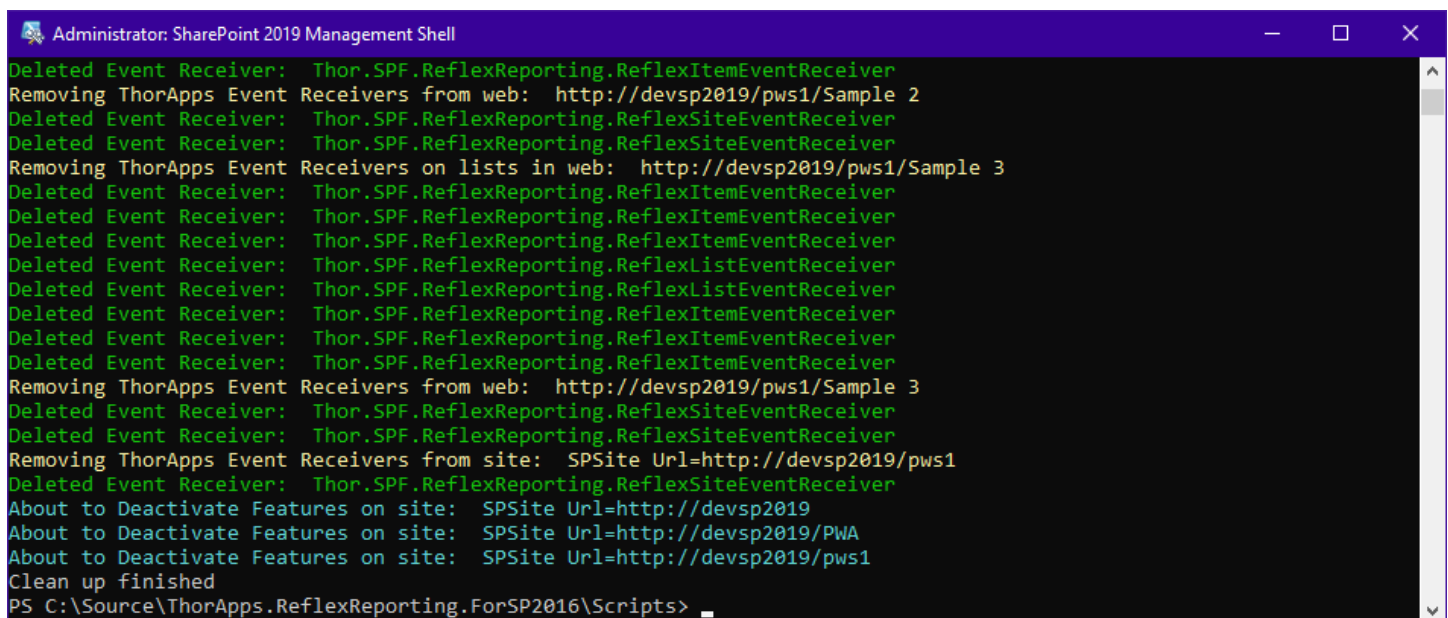
The final step is run a PowerShell script to clean up any event receivers registered by Reflex Reporting.

The Reflex Reporting installation package (now) includes a “scripts” folder with the script to run. If your installation package does not include a “scripts” folder, you can download the package again from <https://docs.thorapps.com/Downloads/ThorApps.ReflexReporting.For2016.zip>

On the server running SharePoint Central Administration, open a SharePoint PowerShell console, navigate to the Reflex Reporting installation script folder and execute the script “RemoveEventreceivers.ps1”.



```
Administrator: SharePoint 2019 Management Shell
PS C:\Source\ThorApps.ReflexReporting.ForSP2016\Scripts> .\RemoveEventreceivers.ps1
```



```
Administrator: SharePoint 2019 Management Shell
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Removing ThorApps Event Receivers from web: http://devsp2019/pws1/Sample 2
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexSiteEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexSiteEventReceiver
Removing ThorApps Event Receivers on lists in web: http://devsp2019/pws1/Sample 3
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexListEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexListEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexItemEventReceiver
Removing ThorApps Event Receivers from web: http://devsp2019/pws1/Sample 3
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexSiteEventReceiver
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexSiteEventReceiver
Removing ThorApps Event Receivers from site: SPSite Url=http://devsp2019/pws1
Deleted Event Receiver: Thor.SPF.ReflexReporting.ReflexSiteEventReceiver
About to Deactivate Features on site: SPSite Url=http://devsp2019
About to Deactivate Features on site: SPSite Url=http://devsp2019/PWA
About to Deactivate Features on site: SPSite Url=http://devsp2019/pws1
Clean up finished
PS C:\Source\ThorApps.ReflexReporting.ForSP2016\Scripts>
```

## (Optional) Remove ThorApps License Manager

**Note:** Do not remove the ThorApps License Manager if other ThorApps products are installed.

To remove the ThorApps License Manager repeat the steps described above and ...

1. Remove the SharePoint farm feature “ThorApps License Manager”
2. Retract the solution “thor.spf.licensemanager.wsp”
3. Remove the solution “thor.spf.licensemanager.wsp”

# In-Place Upgrades

## Overview

You can perform “in-place” upgrades of Reflex Reporting for new versions within the same SharePoint Platform (i.e., upgrades of Reflex Reporting, not upgrades of SharePoint e.g., 2016 to 2019).

When performing an “In-place” upgrade of Reflex Reporting, you only need to retract and remove the existing farm solutions (WSP’s) and then upload and deploy the new solutions. You do NOT need to deactivate Site features or re-create databases, but you will need to re-activate farm and (if applicable) web application features.

**NOTE:** You also need to deactivate and reactivate the “Reflex Reporting” farm feature in SharePoint Central Administration. Don’t forget this step!

Also, if your environment is using the Site Collection level User Interface (SCUI), you will need to Re-Activate the Web Application feature “Allow Reflex Reporting Site Collection User Interface”.

## Backup/Rollback

Before starting an “In-place” upgrade of Reflex Reporting you need to ensure you have a reliable rollback process in the event of an issue. The process needs to cover both types of Reflex database (schema and reporting) and the SharePoint servers themselves for binary changes.

This guide does not cover your backup and rollback procedures, as they are often unique and specific to each organisation, but valid backup and rollback methods can be ...

1. Virtual Machine snapshots (recommended for simplicity)
2. SQL database backups + installers for previous version of Reflex binaries

## In-place upgrade steps

To remove and retract existing ThorApps farm solutions, use the PowerShell Commands or User Interface steps described in the sections “Retract Farm solution” and “Remove Farm Solution”.

To upload and deploy the new ThorApps farm solutions, use the PowerShell Commands or User Interface steps described in the sections “Upload Package Files” and “Deploy Solutions”. Samples of the PowerShell commands can be found in the deployment “Scripts” folder in a text file labelled “SampleCommands.txt”.

When upgrading Reflex Reporting, upgrade all farm solutions currently installed, including...

- Thor.SPF.LicenseManager.wsp

- Thor.SPF.ReflexReporting.wsp
- Thor.SPF.ReflexReportingSCUI.wsp (if used)

See the screenshot below for the sequence of PowerShell Commands to execute.

## PowerShell In-Place upgrade

You can use the User Interface in SharePoint Central Administration as described in the Install and Rollback sections of this document, but the screenshot below details using the PowerShell commands.

## Power Cycle (reboot)

To ensure all SharePoint servers pick up the new version, you will need to power cycle all servers with SharePoint installed (i.e., this usually excludes the SQL database server).

Alternatively, you can also just stop and restart IIS and the SharePoint Timer service on each of the servers to avoid a full reboot.

## Deactivate and Re-activate the “Reflex Reporting” Farm Feature

To ensure any database upgrade actions have been applied, De-activate and re-activate the SharePoint Farm level feature “Reflex Reporting”. Re-activating this feature also ensures the version number recorded in the License Manager is updated.

## Re-activate the “Reflex Reporting” Web Application Feature

If you’re also using the Site Collection User Interface features, you will need to re-activate “Reflex Reporting” Web Application Feature for the Web Applications that contain the Site Collections where the feature is used.

## Any Questions?

Please contact our team of specialists at [info@thorapps.com](mailto:info@thorapps.com).