SharePoint Online Technical Guide

UNIVERSITY OF OXFORD

Using the Microsoft SharePoint Migration Tool (SPMT)

What does this guide cover?	How to use the SharePoint Migration Tool (SPMT), some examples of use and the risks and issues in using it
Who is it aimed at?	Site Collection Administrators (SCAs) and Site Network Administrators (SNAs)

Overview

The Microsoft SharePoint Migration Tool (SPMT) is an installable migration tool designed to run on Windows platforms. The aim of the tool is to provide a one-stop migration solution for site collections, sites, libraries and lists in SharePoint on-premise, local file shares or OneDrive instances into Office365 cloud services including Microsoft Teams, Microsoft SharePoint Online and OneDrive for Business.

The tool can be set to migrate document content, providing migration templates that can be used multiple times for specific source and destination sites.

Contents

System and User Requirements

SPMT requires the following:

- A Microsoft Windows PC (tested using a Windows 10 Pro VM installed on a Mac)
- Site Collection Administration access to the SharePoint on-premise site, or the file shares / OneDrive instances
- SNA or Site Administration access to the SharePoint Online site

Downloading and installing the Microsoft SharePoint Migration Tool.

The migration tool is available directly from Microsoft. There are usually multiple versions available. We advise you to use the Full General Availability version in any planned migrations (this documented testing used Version 3.2.118.0)

Download via the version links and install on your Windows PC.

Initial setup and configuration

When the tool is run for the first time (run the tool as administrator on your PC by right-clicking the launch icon and choosing 'run as administrator). You will be prompted for your Nexus365 user credentials so enter those in the following format:

- Username: sso@OX.AC.UK
- Password: your usual password

You will be redirected to the usual Shibboleth Login Screen so enter your credentials as follows there:

- Username: your SSO
- Password: your usual password

Once done you will see the SPMT Welcome Splash Screen:
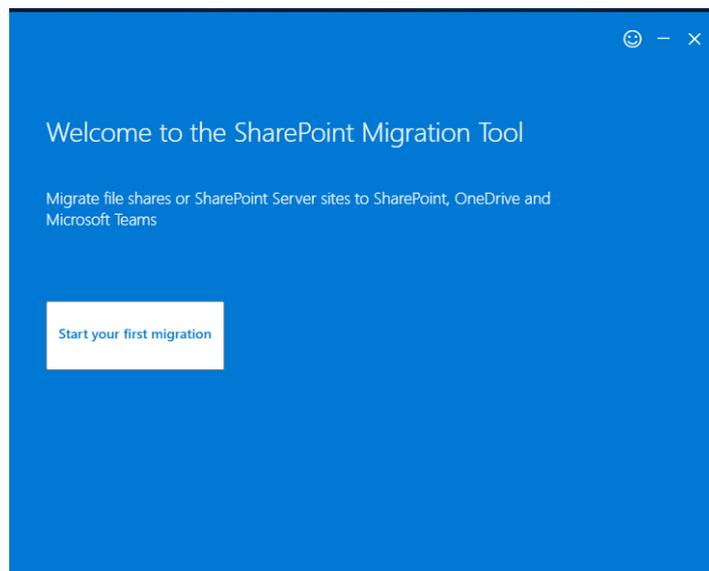
Click the "Start your first migration" button to begin.

You will then see a choice screen for the source part of your migration:
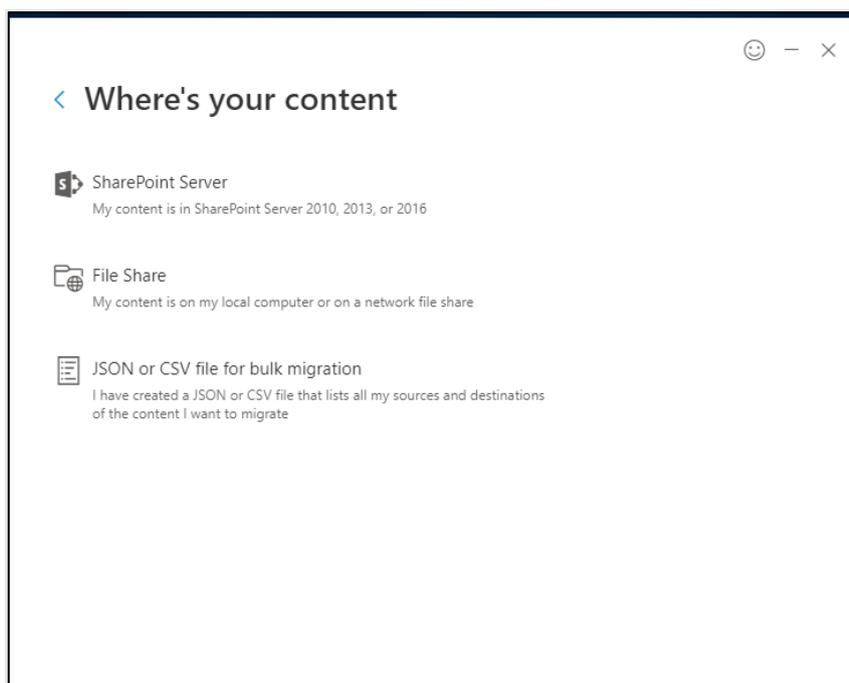
Select "SharePoint Server" and you will see the following prompt screen for the location of your on-premise SharePoint Site:
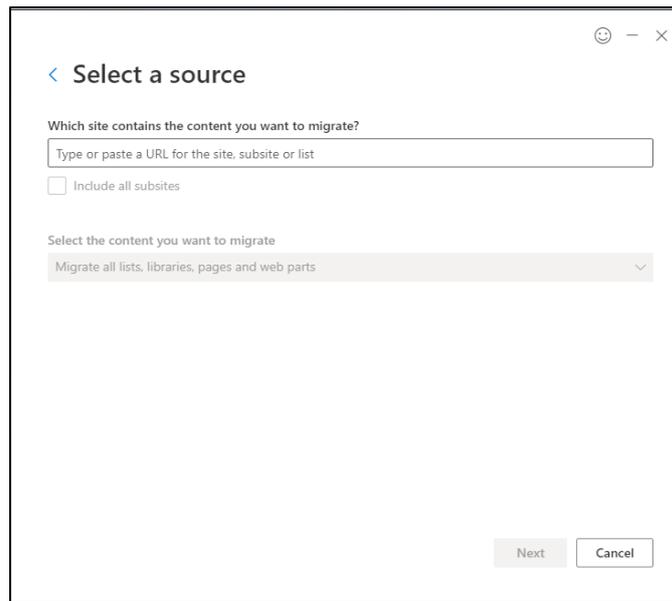
Type in the URL of the site you want to use as your Migration **source**. Note that if you type in the root URL of the site collection that's going to make things extremely difficult for picking out content, particularly if you have a lot of subsites, so narrow it down to the URL of a subsite if that's where your content is.

Next you'll be required to sign in, this time with your SharePoint On-Premises credentials:
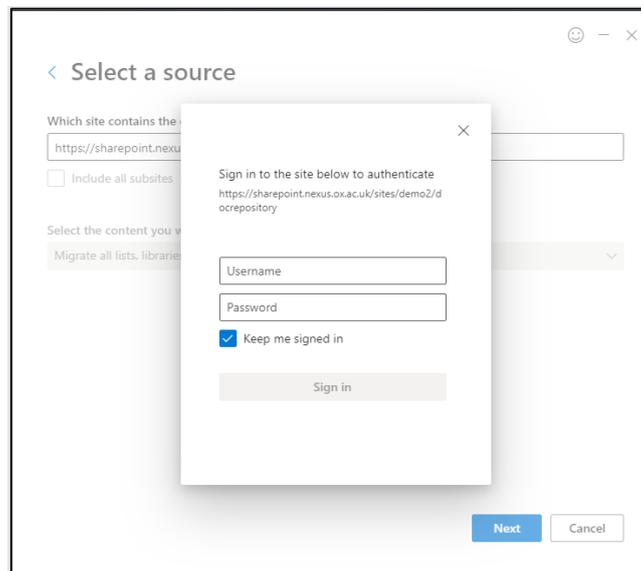
This time you need to fully qualify your username with the Active Directory Domain on premises, so your username and password should be in the following format:

- Username: ad-oak\yoursso
- Password: your usual on-premises SharePoint password

Leave the "Keep Me Signed In" box ticked and then click "Sign In" (note that although this is still enabled for SharePoint on premises, keeping this ticked actually does nothing, as the client is not intelligent enough to know that you are signed in under MFA with KMSI switched off.)

Note that if you are NOT the Site Collection Administrator for the SOURCE site, you won't get any further.

Recommended settings for Document Migration and an example document library migration with metadata and versions preserved

For the first example we will perform a simple document library migration.

The settings used in the example assume that you have a destination site in SharePoint Online, and that you are creating a **new** document library under that site to host the content you're migrating.

First, select the source URL of the site you're moving content from.
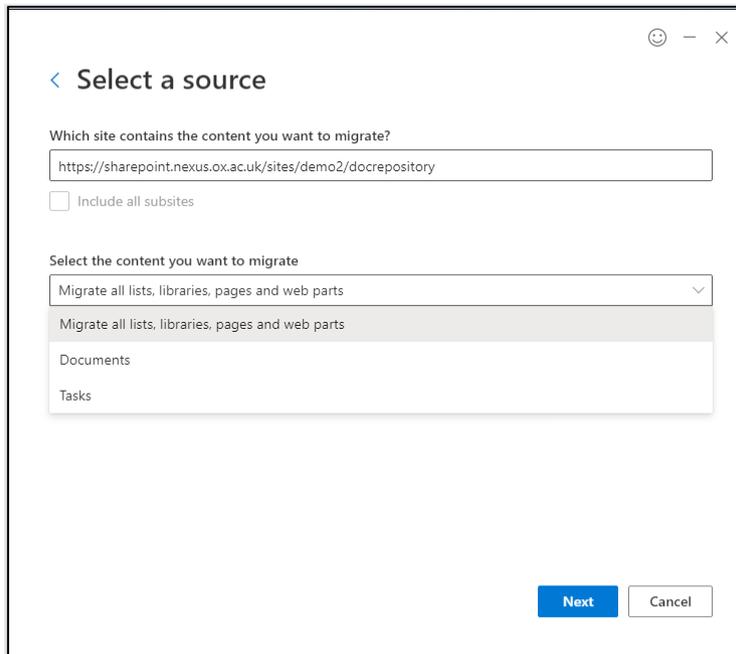
Once you've put in the correct URL you will be given a drop-down choice screen with three options:

- Migrate all lists, libraries, pages and web parts
- Documents
- Tasks

Select the "Documents" option and then click next.

You will then see a screen requesting the destination you're moving content to:
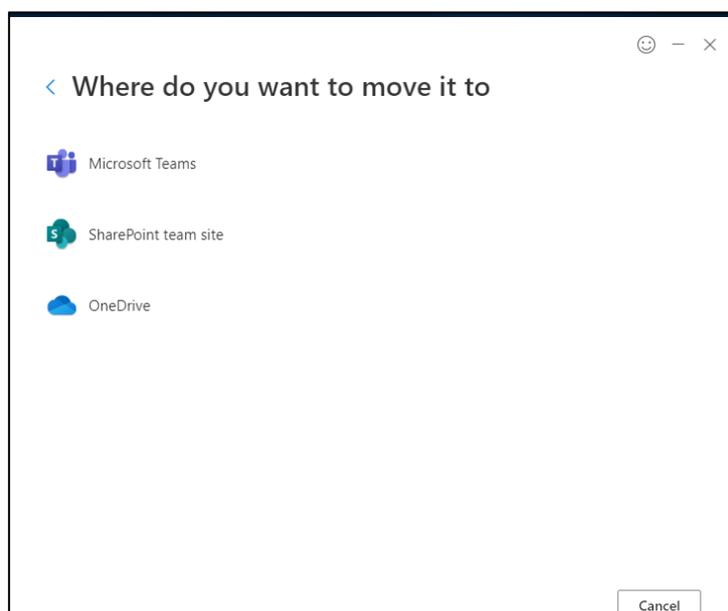
As you can see, there are three choices here but we're only interested in SharePoint so click "SharePoint Team Site" (or if you are moving to a Comms site, click "SharePoint Comms Site") to continue.

The next screen requests some details about the destination site:
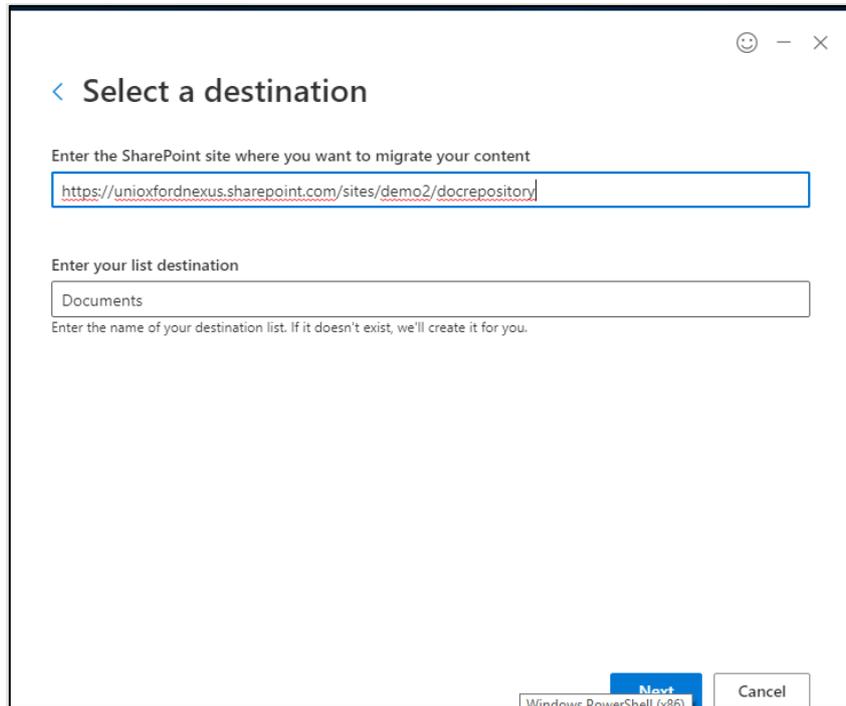
In the first box, Microsoft assume that you have a 'like for like' site set up in SharePoint Online. This won't be the case, so type in the exact URL of the SharePoint Online site you're moving your document library to.

Once you've done that, you will need to type in the 'list destination' name. Though Microsoft have helpfully filled in 'documents' as a name, this will likely try to overwrite your already-existing documents library in your **destination** site. So give it a unique name that reflects the type of content, where the documents have been migrated from. Once done, click 'Next" to continue. You will then see the "Review migration" screen:
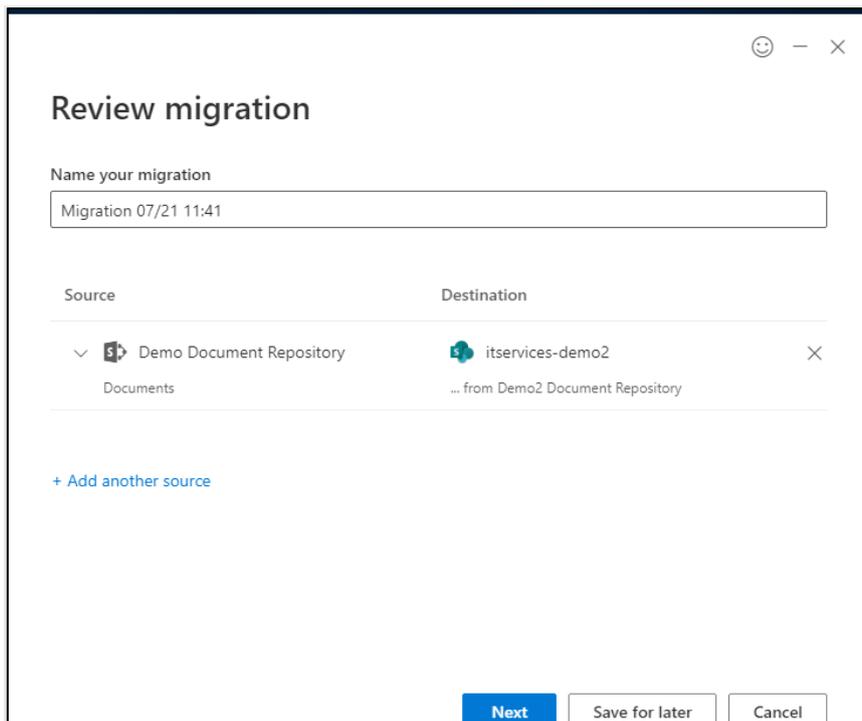
The name of the migration can be typed into the first window (Microsoft provides a default date-stamped option). You are also given the choice to add in another migration source but it's best to tackle content migrations in small batches so we will stick with just a single document library migration for this example.

Once you're happy with the summary screen, click "Next" to continue. You will then see the migration settings screen. There are lots of changes you need to make here so we'll go through them all one by one:
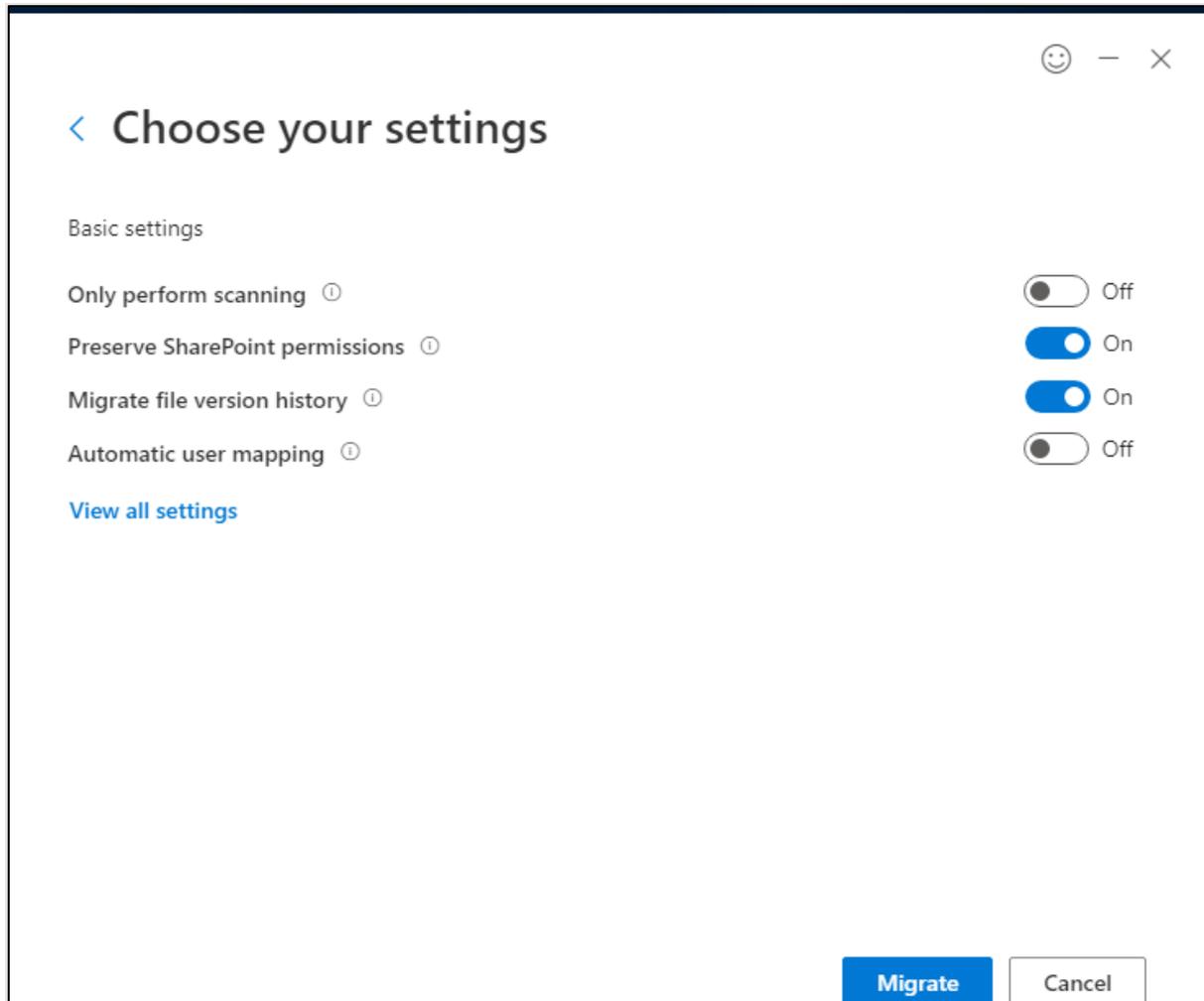
The screen only shows the basic settings at first, but we need to see **all** the migration settings as there will be several we need to change.

Click the "View All Settings" link and the advanced migration settings screen will be shown. Let's tackle the ideal settings for this screen section by section:
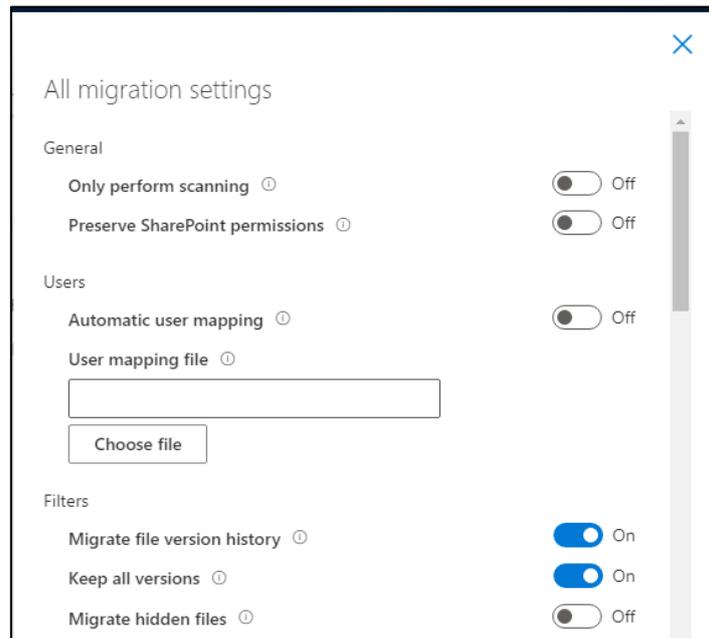
General:

- Only Perform Scanning – Set to "Off"
- Preserve SharePoint Permissions – Set to "Off" (we will explain why later in this document)

Users:

- Automatic User Mapping – Set to "Off" (we will explain why later in this document)
- User Mapping File – Leave Blank

Filters:

- Migrate File Version History: Set to "On" (please do this if you don't have ridiculous numbers of versions – otherwise set to "Off")
- Keep All Versions – Set to "On" (see the caveat above)
- Migrate Hidden Files: Set to "Off"

Continuing the Filters section:

- Set the "Migrate Files Created After" and "Migrate Files Modified After" filters accordingly (or just leave them as they are to migrate all content regardless of created / modified dates).
- Do Not Migrate files with these extensions: Leave blank.
- Migrate files and folders with invalid characters – Set to "On" (SharePoint Online will filter out anything it can't handle anyway)
- Filter Subsites – Leave blank (we don't use Subsites in SharePoint Online anyway)
- Filter Lists and Libraries – Leave blank
- Filter content type – Leave blank

All migration settings

Skip list with audience targeting enabled ⓘ — On

Migrate all site fields and content types ⓘ — Off

Migrate managed metadata ⓘ — On

Migration of web parts and pages ⓘ

○ Overwrite duplicate

○ Rename duplicate

○ Skip duplicate

◉ Do not migrate

Temporarily allow migration of scripts ⓘ — Off

Migrate site navigation ⓘ — Off

Advanced

Migration auto re-run ⓘ

◉ Run once

○ Run up to 5 successive times

The "SharePoint Section (shown above) is configured as follows:

- Skip lists with audience targeting enabled: Set to "On"
- Migrate all site fields and content types: Set to "Off" (it's not a good idea to bring older content types and site fields over from SP2013 into SharePoint Online so do not set this to ON unless you want to potentially make a mess of your new SPO site).
- Migrate Managed Metadata: Set to "On"
- Migration of Web Parts and Pages: Set to "Do Not Migrate" (again, it is not a good idea to try and migrate old SharePoint 2013 web parts and pages, as this will just make a mess of your SPO site. Consider recreating pages in SPO's own page creation tools, and consider using SPO web parts instead of old legacy stuff).
- Temporarily allow migration of scripts: Set to "Off"
- Migrate site navigation: Set to "Off" (see above, a very quick way to mess up your new site).

Advanced Section settings:

- Migration Auto Re-run settings: Leave at "Run Once" (retries may 'hang' your sites on both ends if your migration gets stuck in a loop so better to have it just try running once before bombing out).
- SharePoint Migration Tool Working Folder: Leave blank (sometimes you can specify a local folder that SPMT will use as a staging area but it works equally well without one.
- Use Custom Azure storage: Set to "Off" (as we do not have this facility).

Once you have your settings set as above, click "Save" to save this migration configuration as the default for all future document migrations.

Once done you'll be back at the migration screen, so click "Migrate" and you will then see the Migration Progress screen (this may take a while):

'Migration 07/21 11:41' in progress

Migration details

5%

Migrating Demo Document Repository to itservices-demo2
Migrating structure Site (....ac.uk/sites/demo2/docrepository)
View reports

Start new migration
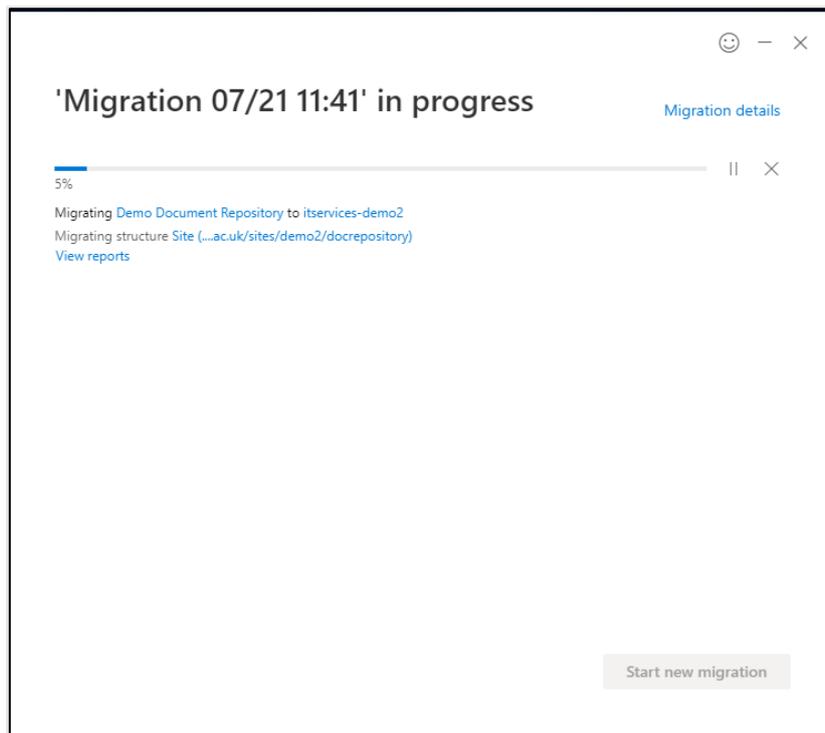
The migration shows a progress bar and the details of what content is being migrated. You can also click the "Migration Details" link to see the reports generated during the migration (in .CSV format, handy for error trapping and troubleshooting) and the "View Reports" link will also give you more details on your migration.

Once done, you should see the following Migration Summary screen:

Migration ended

Total scanned 6 item(s), 0 item(s) with scan issue, 0 item(s) filtered out
0 item(s) out of 6 migrated
0 Bytes out of 1.86 MB migrated

View reports

Save 'Migration 07/21 11:41' before closing?
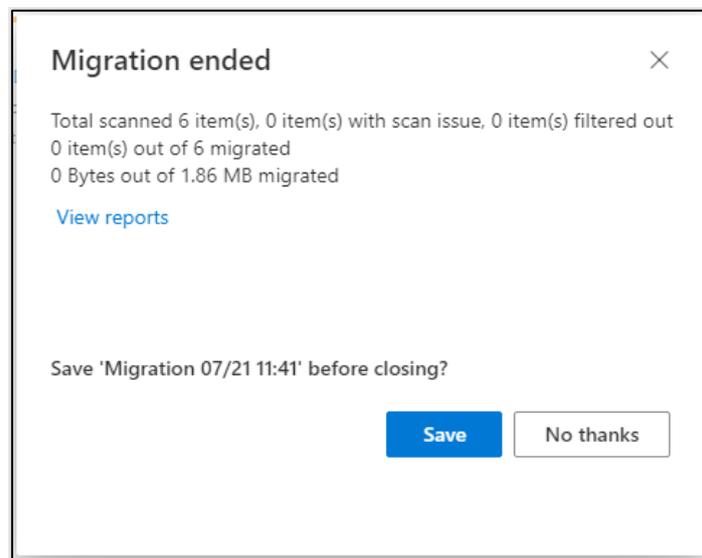
Save   No thanks

There is an option to save this migration to re-run again at a later date. Click "save" or "no thanks" accordingly and you'll be back at the migration screen with the option to start a new migration.

Here's a comparison of the two sets of content in SharePoint On-Premises and SharePoint Online.

On-premise:
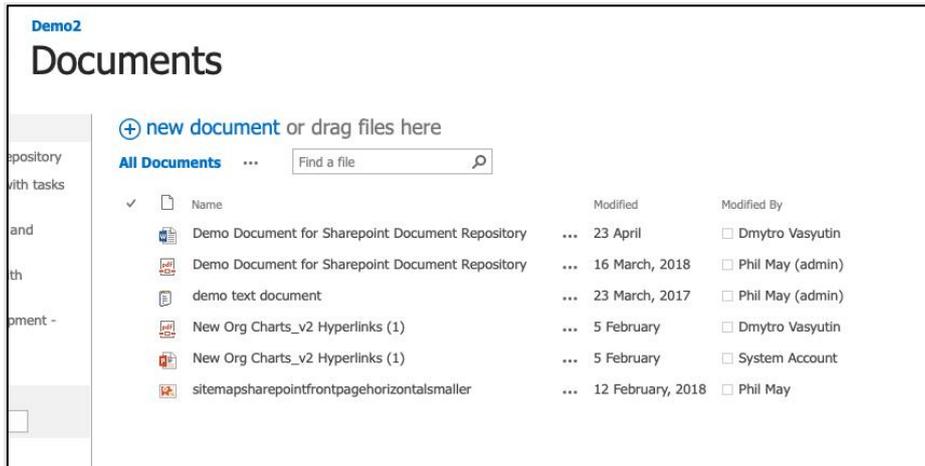
SharePoint Online:
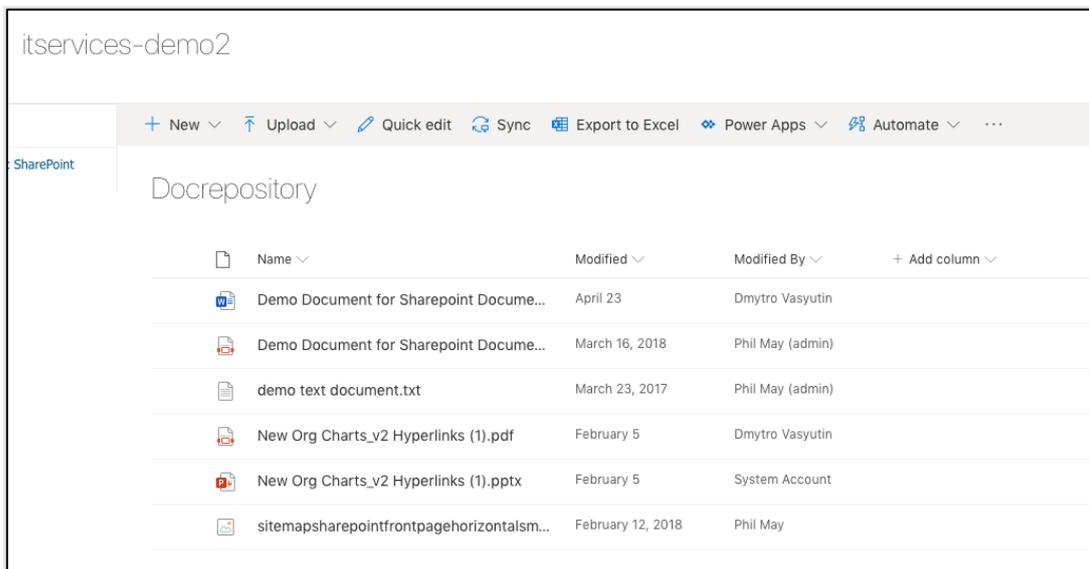
As you can see, the migration has preserved "Modified" and "Modified by" metadata and if we look at the version history of a document in both places:

On-premise Version History of the first document in this list:
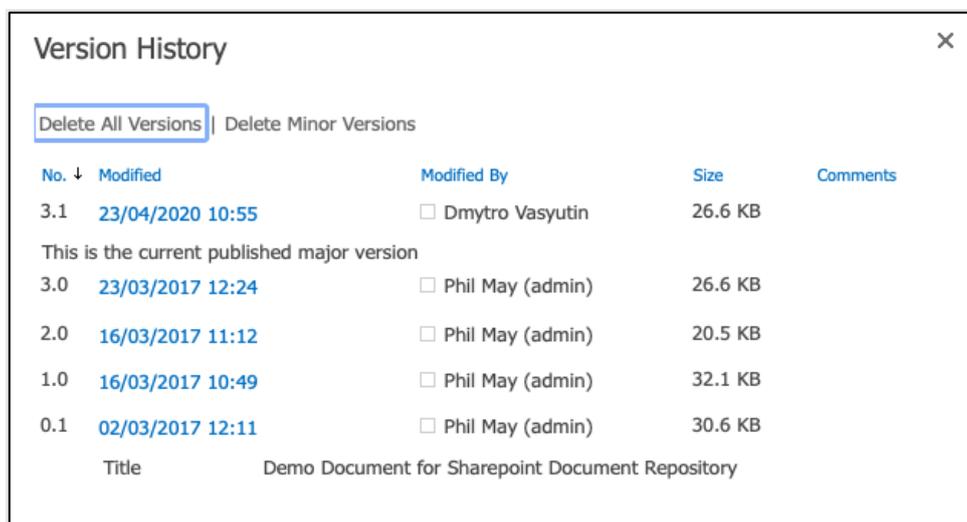
SharePoint Online Version History of the same document:
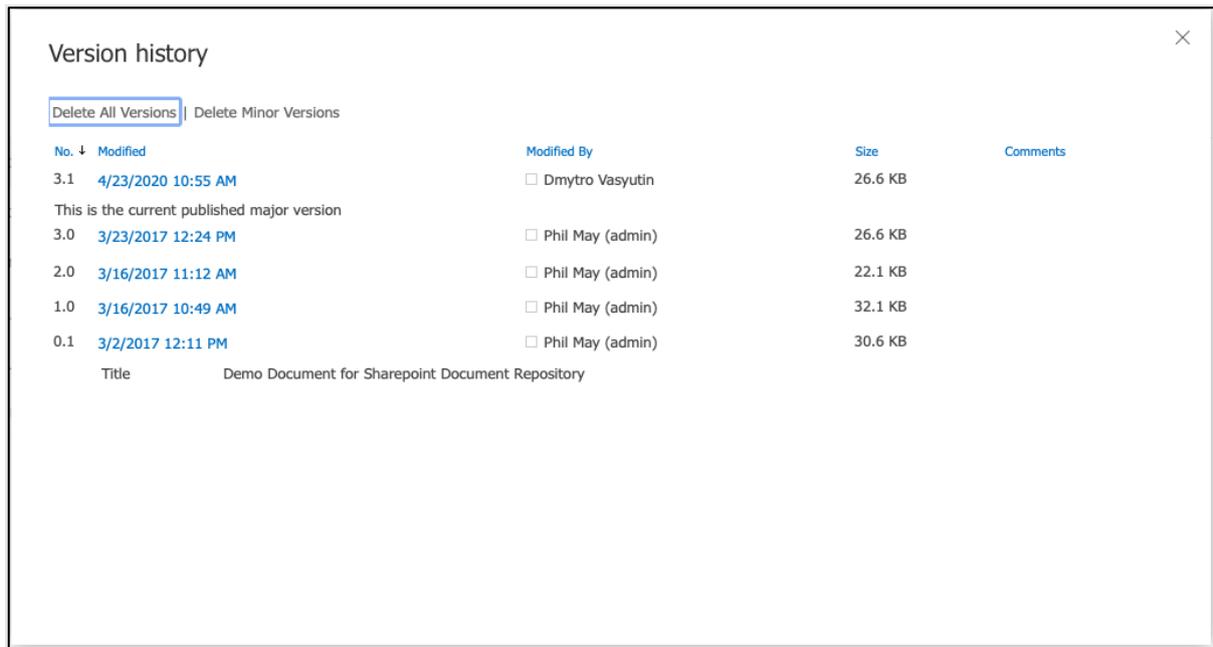
You can see they're identical, meaning all versions were also brought across.

Recommended settings for List Migration and an example list migration with metadata and versions preserved

SPMT can also migrate various list types (with varying degrees of success) between SharePoint on-premise and SharePoint Online. There are many ways to export a list without using SPMT, but the tool does offer a neat and quick method of transferring if the migration settings are set correctly.

For this example, we're going to move a list with less than 500 items in it. With SPMT we would advise users **not** to try moving large lists full of data – try to consider the list view limits in SharePoint on-premise and in SharePoint Online (5000 items) so aim to try and use the tool for lists containing less than 5000 items unless you are able to work on this after 9pm, when the list view threshold is lifted to limit the impact on the service during working hours.

To begin, start SPMT as an administrator on your local machine as usual, provide your credentials and click the "Start Your First Migration" button.

Click "SharePoint Server" as your choice of SOURCE and then enter the URL of the SharePoint On-Premises site you want to migrate your list from. You will need to provide your SharePoint On-Premises credentials for this so remember to provide them in the following format:

- Username: ad-oak\Your SharePoint On Premises Username
- Password: Your SharePoint On-Premises password

Once done you should see the following screen with your **source** site URL and a drop-down picklist containing items for migration from that site:
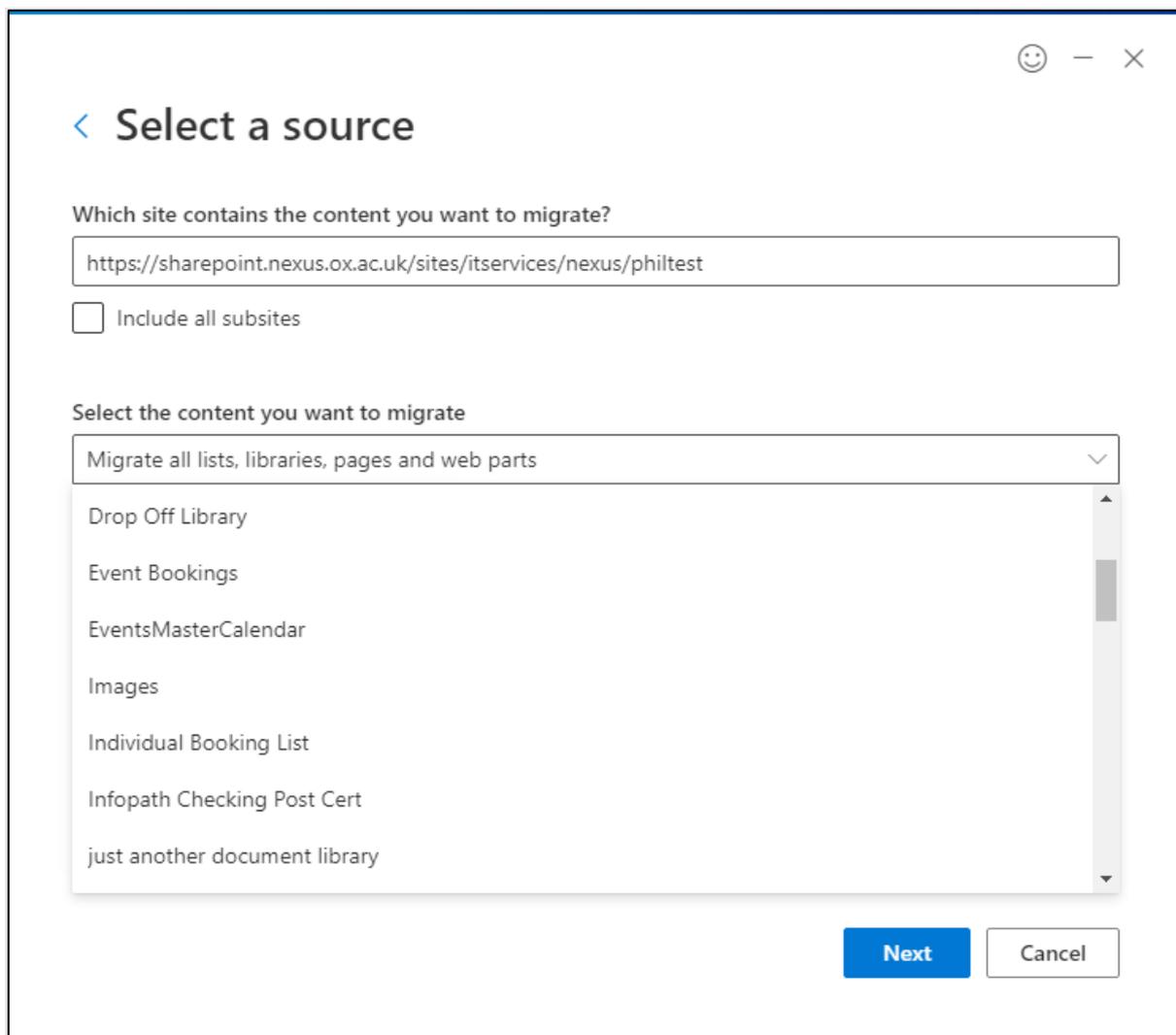
As you can see in the above screenshot, I've expanded the pick list – and you will see a mixture of document libraries and lists shown here. For this example I will be selecting a list containing around 50 items, with document attachments, a Nintex Workflow and a Nintex Form (note that the Nintex content will be stripped out).

Select the list you want to migrate, then click "Next" to continue. You will see the **destination** screen giving you a choice between a SharePoint Team Site and Microsoft Teams:
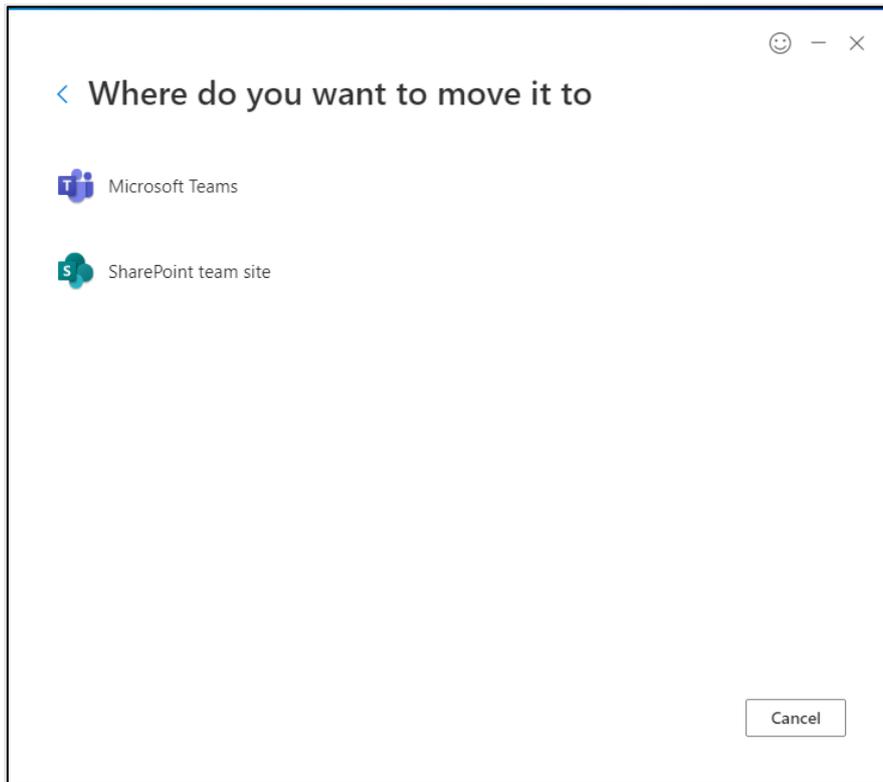
Select "SharePoint Team Site" and you will be prompted for the URL of your DESTINATION site, and the name of the list as it will exist in your destination:
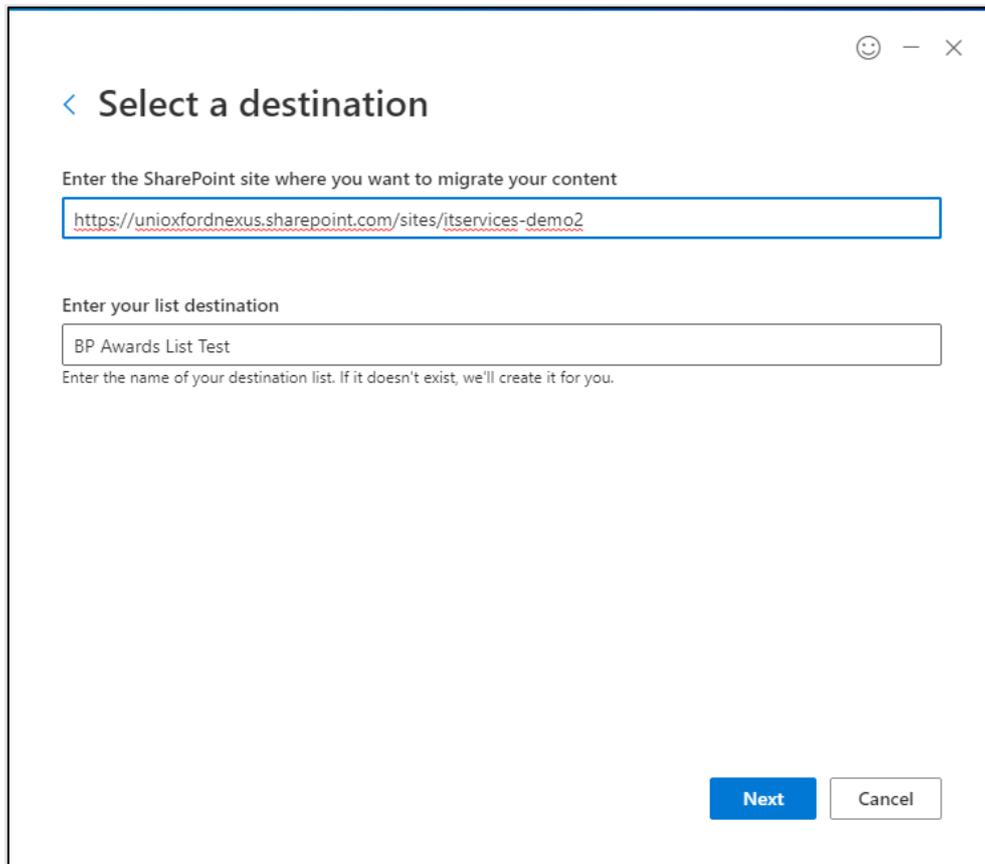
Note that if you **do not** change the URL to reflect a site that you are the administrator or owner of and is a site that actually exists, your migration will fail before you begin. The SPMT tool tries to offer a default setting but this is often just its 'best guess' at what your destination site will be.

Once you've finished configuring the screen above, click "Next" to continue.

You will then be shown the "Review Migration" screen:
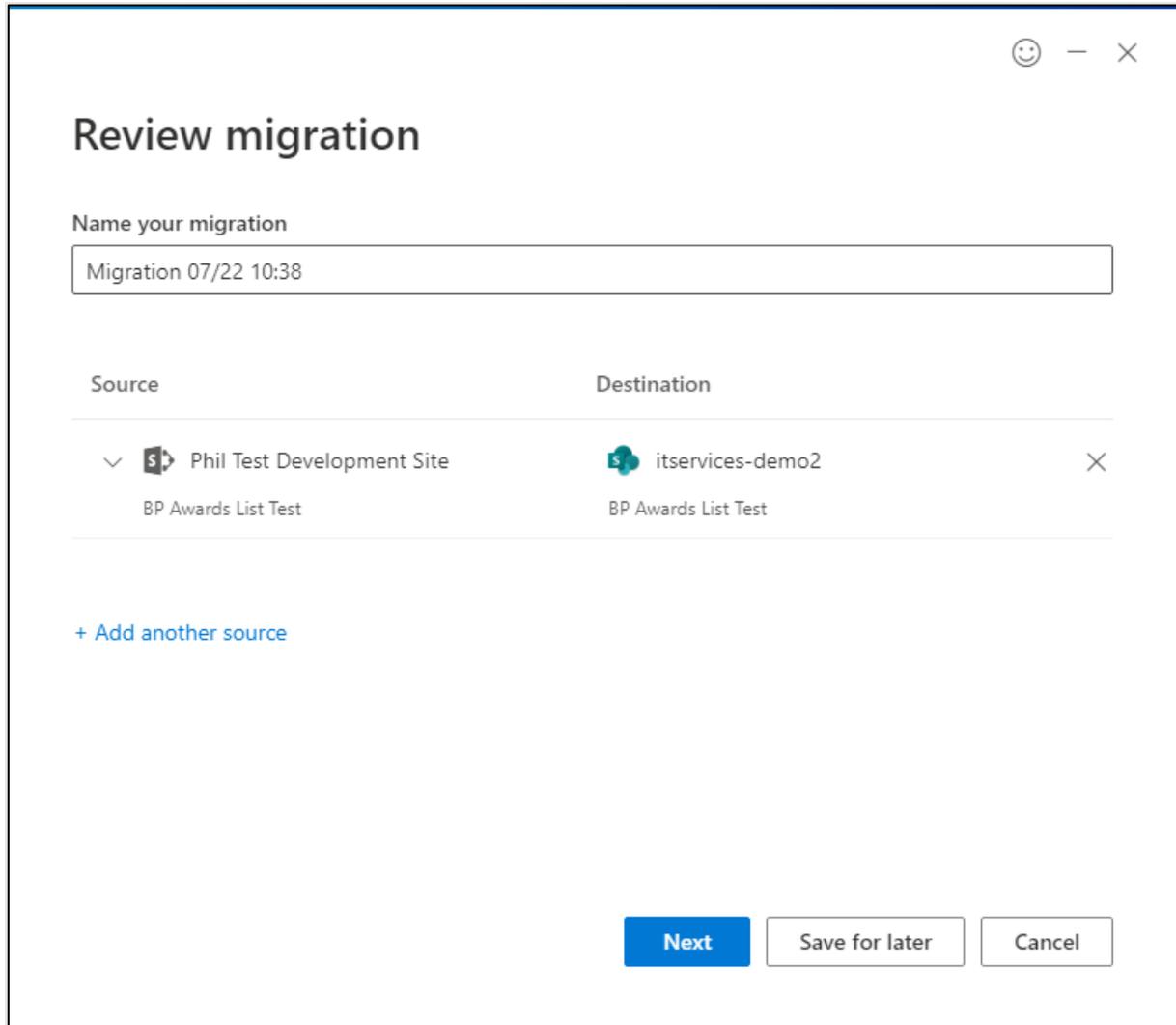
Name your migration (or just leave it as the default migration date-stamped name) then check that the source and destination are correct. You can save your migration for later, or click "Next" to continue.

You will then be shown the migration settings screen:
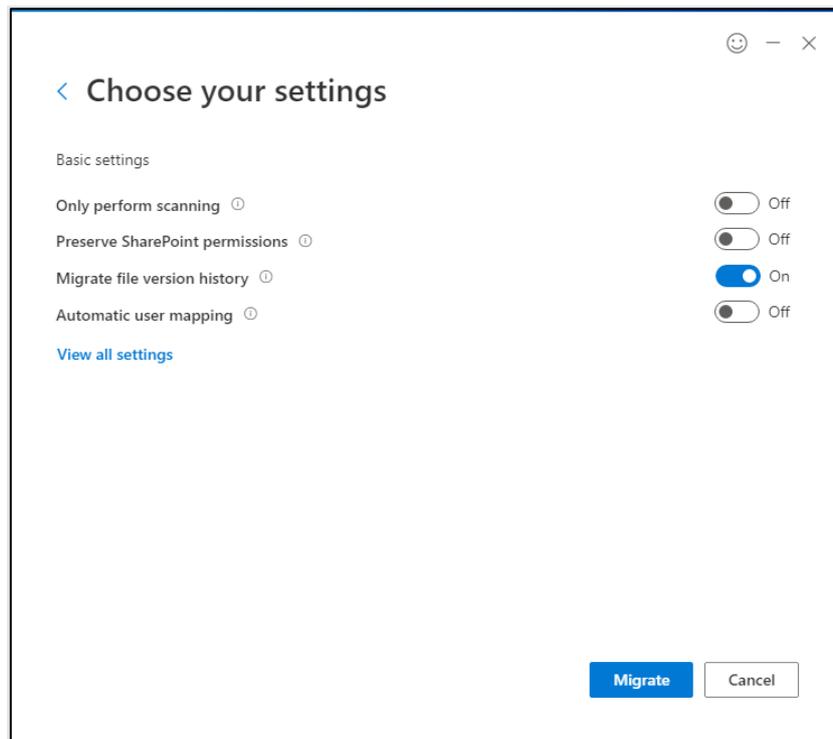
We recommend using exactly the same settings for migrating a list as demonstrated in the previous section about migrating document libraries. Bear in mind that this example chooses the best supported path for migration – just moving the list – without the mess that results from moving permissions or structure.

Once you're happy with the settings, click "Migrate" to start the migration process. You will then see your progress window:
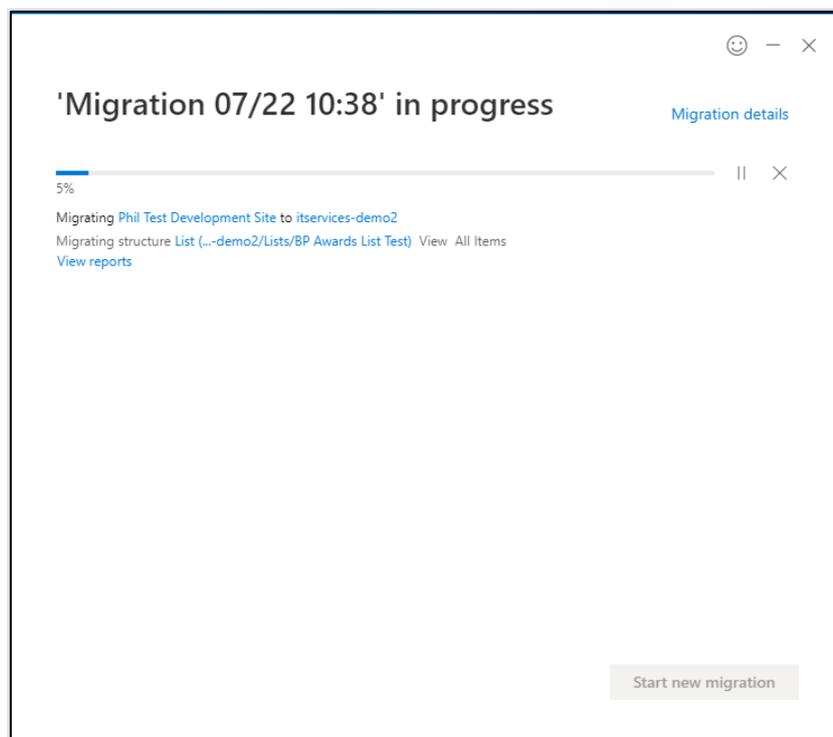
it may take a while before it finishes., e.g. this example took 9 minutes for 50 items

Once done, you'll see a confirmation screen like this:
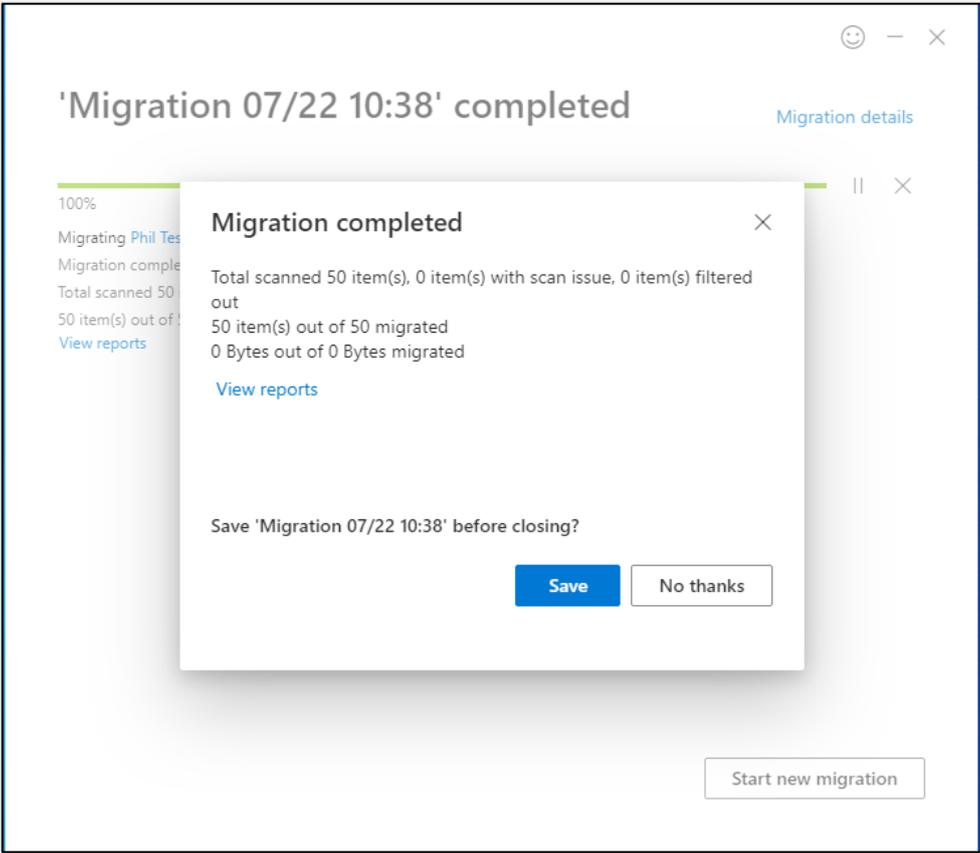
For reference, here is the list being migrated as it appears in SharePoint on-premise:

And here is the same list in SharePoint Online once the migration had completed:

SharePoint Online doesn't fill in a 'no title' field where a list item genuinely has no title, but you can still view / use the list.

Some observations on this list migration

1) List metadata (Created, Created By, Modified, Modified By) was preserved successfully
2) The list did not contain versions but these would also have transferred successfully
3) All attachments in the list transferred successfully along with the list data
4) The migration took around 9 minutes to complete for the 50 items
5) No "extras" appeared during this migration (with the document migration, the "Style Library" in SharePoint Online was filled with structural stuff – this is a bug discussed in the next section)
6) The quick launch menu didn't disappear (this is another bug discussed in the next section)
7) As expected, the Nintex Workflow for the list and the custom Nintex form did not migrate so the list appears without a workflow, and with the standard SharePoint Online form instead (but will still accept new data, preserving all columns except the workflow action / status column which would obviously not be transferred)

All in all this was a quicker and more successful method of transferring a list from on-premise to SharePoint Online.

Troubleshooting - Risks and issues of using SPMT

The Microsoft SharePoint Migration Tool is a very powerful tool , but there are risks and issues with using this tool. The list below goes through some of the most common problems encountered when using the tool.

Site collection settings / site settings will be enabled on your SharePoint Online site, regardless of what settings you use in your content migration

In SharePoint Online sites, you have an identical set of settings for sites and 'site collections' that you had in SharePoint on-premise. The problem is that a lot of these settings are detrimental to a modern site, and in fact can break certain aspects of modern site functionality. In a couple of test migrations it was apparent that the Quick Launch Menu was breaking, for example. The migrations had surreptitiously switched on Site Publishing Features and SharePoint Publishing Infrastructure settings in site settings / site collection settings respectively. These two settings are no longer recommended / no longer in common use in modern sites, and will hamper any attempts to edit site pages, edit the quick launch menu or format your pages using SharePoint Online Modern best practises. Even if you disable the settings after your migration you will find that "Save Site as Template" for a non-group connected Teams site can never be used again. Migration tools in general do odd things to SharePoint Online sites but SPMT is no better than ShareGate for some of the things it does behind the scenes.

Whole site collection / site migrations are a very, very bad idea

Consider that if you are migrating from an old version of SharePoint (2013, which has already been migrated 'in place' several times from 2007 to 2010, and 2010 to 2013), and you attempt to migrate an entire site collection you are bringing across all the threads of deprecated content, all the features and content types from older versions of SharePoint that don't exist in SharePoint Online. You will also be bringing over web parts that are no longer supported, pages that contain content that is no longer supported, permissions and presence details of users that have no commonality in SharePoint Online (whether they are current users or users that have left the university) and many other issues resulting from trying to do a "Lift and Shift" migration (i.e. trying to replicate a site exactly from SharePoint on-premise in SharePoint Online). Consider only using the tool to move individual items of content from your site, using the recommended migration settings detailed in the previous section.

Migrating large content is also a very bad idea

SPMT is fairly resilient but the tool works by accessing your content in both locations, both reading / temporarily storing content from your SharePoint on-premise site then writing that content (including back-end elements such as metadata etc) to your new SharePoint Online site. In our example above we purposely chose to do this for a fairly limited set of document data. In testing, the tool would effectively hang up both sides of the migration (Source and Destination), sometimes causing the sites to error or appear to be offline, which is not ideal if you're doing this to a service that is still in use by your users. Concentrating on smaller pockets of content is wisest, as it means the migration will complete quicker, and not hang your sites up while it's doing what it needs to.

Permissions will not carry across from source to destination

This is vitally important to consider, particularly for sensitive content. In essence, all permissions are reset during a migration because there's no accurate way of 'mapping' permissions between SharePoint on-premise and SharePoint Online. You effectively use two different accounts to access each service, with only your SSO as the commonality between them. Unfortunately, in testing, trying to 'map' SSOs 'like for like' between SharePoint on-premises and SharePoint Online doesn't work, due to the unique way our accounts were created – again with no commonality between User Principal Names, Domains or other presence details. In essence, assume that everything in your destination site will need to have permissions rebuilt for

your content (which is not a problem if you're migrating to an existing library, as your library will inherit the permissions from your site anyway).

It's never, ever a good idea to try and migrate navigation options from SharePoint on-premise to SharePoint Online

Navigation is entirely different between the two services, so in scenarios where SPMT was used to migrate a site, with navigation preserved, the site would effectively appear in "Legacy" or "Classic" mode, with no option to make it a "Modern Mode" site. The previous section uses a method of migration called "Merge Copy" – this is effectively copying content from an existing SharePoint On-Premises site – and ONLY content rather than any of the site structure – into a pre-existing SharePoint Online site which already has its own structure and navigation and will already be in "Modern" mode.

Custom content in SharePoint on-premise will not migrate to SharePoint Online

This includes custom content types, web parts, master pages, and other tweaks and changes you've made to your site. The settings detailed in the previous section are designed to protect your newly created SharePoint Online site so even if you see options to include custom content, you will very quickly break your site if you are tempted to try and use those settings.

Third-party content in SharePoint on-premise will not migrate to SharePoint Online

This goes without saying. None of the third-party services (Muhimbi, ShortURL, Nintex Workflows or Nintex Forms) exist in SharePoint Online so none of the content associated with those third-party solutions will migrate. With the Nintex solutions in particular, even third-party migration tools (such as ShareGate) that offer the option to migrate your forms and workflows still neglect to tell you that you will need to rework your forms and workflows substantially to make them work for the SharePoint Online versions of Nintex. Although this is a moot point as we're not purchasing those tools going forwards, if you are tempted to try and take across lists / libraries or sites that make heavy use of Nintex, all that content will be stripped out during migration and you will be left with your lists, forms and libraries in a 'default' state (the state they were in before you applied those third-party solutions) so will use the SharePoint Online default form for the list, and will also lose any columns in your list associated with Nintex Workflows (along with the workflows themselves).

Sometimes the tool just doesn't work for certain documents

This is an irritation common to most migration tools and I suspect that it has something to do with timeouts in SharePoint (either end) that act as flood control for the services. Running SPMT against large document libraries would always result in missing content, with nothing showing up in the migration logs or files. Almost as if the migration transaction for that particular piece of content was skipped over by the tool (ShareGate, a leading commercial alternative to SPMT based on the same operational migration engine does this too and similarly doesn't log that it's done it either). In cases such as these you have a choice of re-running the migration, or moving the content into another (separate) document library in SharePoint on-premise and trying again (or you could just manually download the file / re-upload it to SharePoint Online but you would of course lose the metadata using that method).

Three weird bugs may happen in the destination (SharePoint Online) Team site during different migrations

There are three annoying bugs which may appear during migration :

1) Despite carefully choosing settings **not** to bring across any structural stuff from SharePoint on-premise (including navigation, pages, web parts etc) the Style Library in the Destination site was filled with nearly 700 old folders :
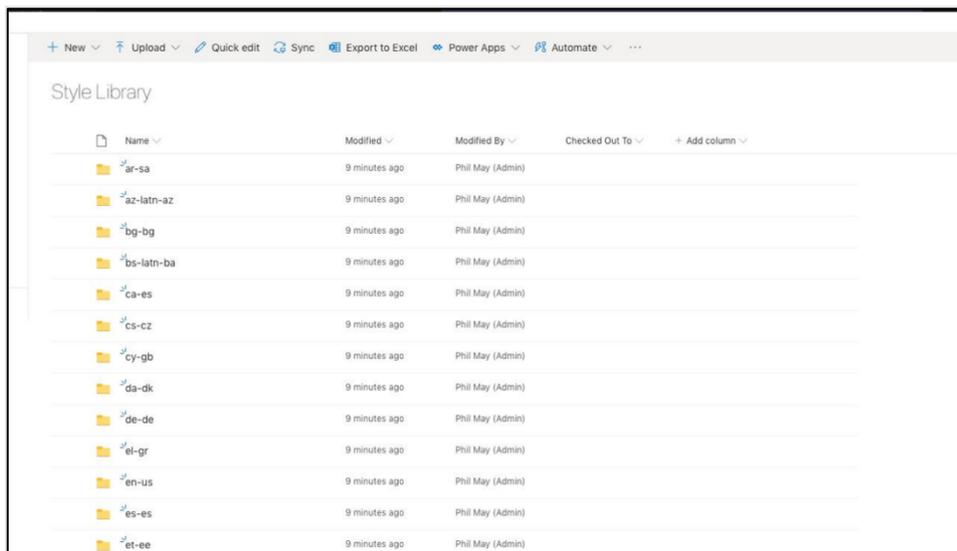
A normal Team Site style library in SharePoint Online looks like this for comparison, so this happened as a result of the migration:
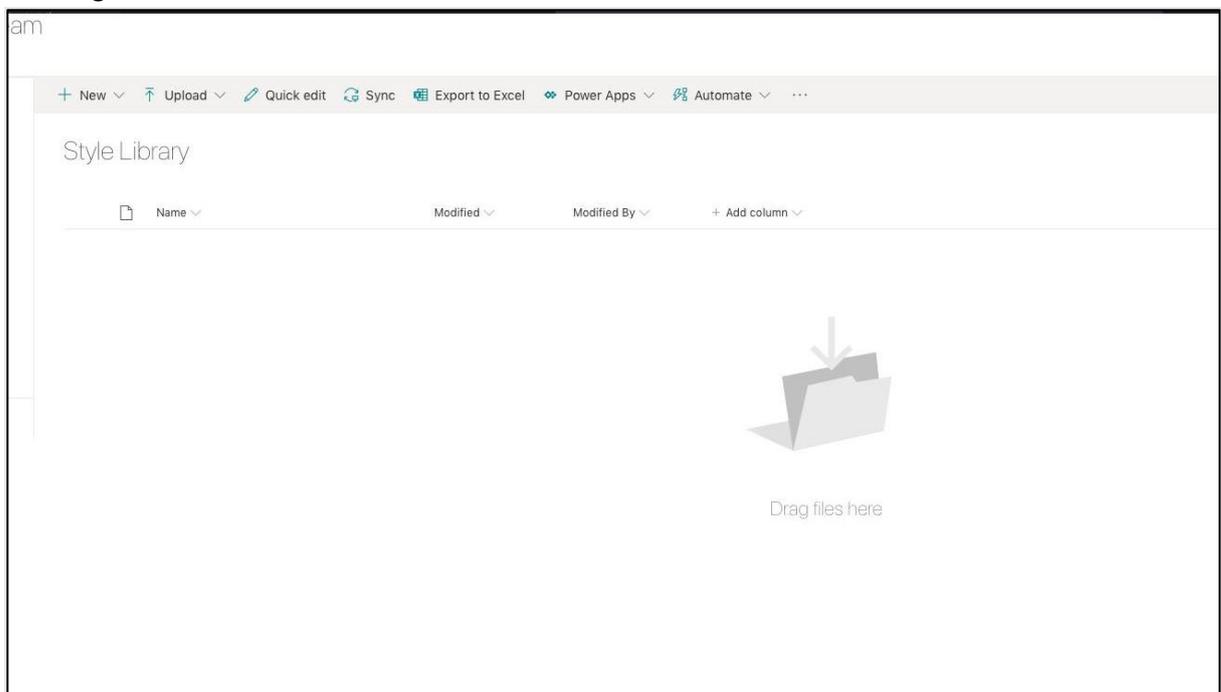
Thankfully deleting the rogue style items from the Style Library had no ill effect on the migrated content so that's a relatively easy fix.

2) The quick launch menu can randomly disappear in the destination SharePoint Online site and could not be brought back . This is far more serious and not related to the deletion of the style items mentioned above). It does render a site pretty much useless though unless you plan to use other means of navigation within your site and can work around not having a quick launch menu. The only choice left is to delete the site and start again, assuming some corruption crept in during migration that somehow 'hosed' the Home Page in SharePoint Online, removing the Quick Launch Menu. Creating a new home page / assigning that as the landing page for a site may be one workaround.

3) The quick launch menu could not be edited via the menu edit link after a migration. On a normal Team site used 'as is', clicking the 'edit' button under the quick launch menu allows you to instantly edit the links. However, after a migration if you click the edit button, this happens:
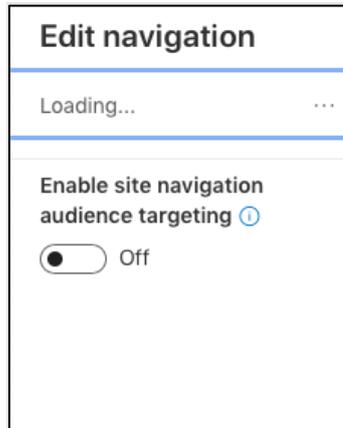
The menu will sit in a "Loading…" state 'forever' .This bug can be replicated very easily regardless of the destination site or the version of the SPMT tool you use. It is easy to rectify – you just need to go into your SharePoint Online site settings and disable Site Publishing Features, then go to site collection settings and disable the SharePoint Publishing Infrastructure settings.

You can also work around the issue by editing the Quick Launch menu from the Site Settings > Navigation options but that's not the preferred method.