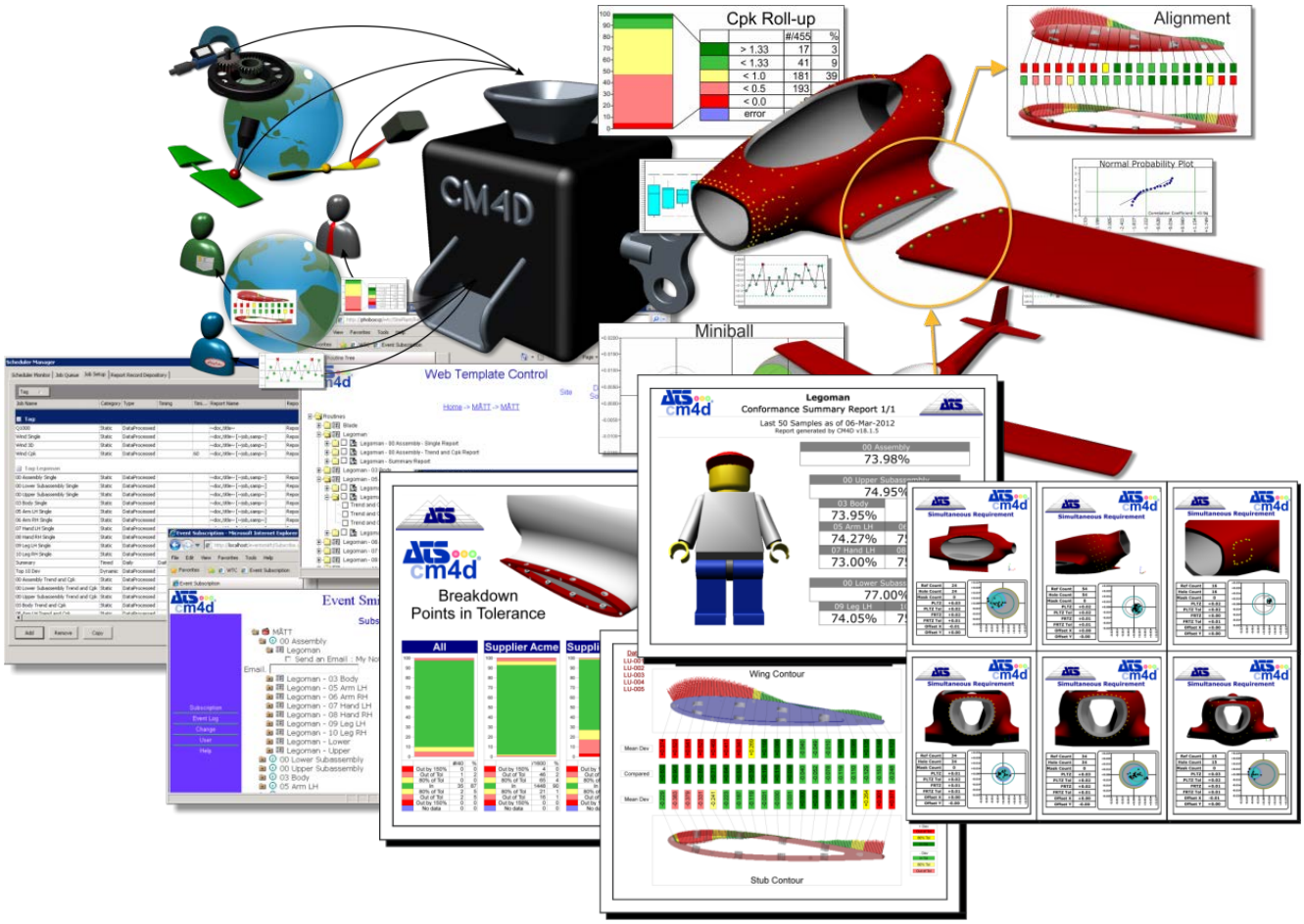
The *Independent* Solution Provider for Industrial and Process Automation, Quality & IT

v21 Migration Guide



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v21 Migration Quickstart

The following steps must be completed in order to successfully upgrade to v21.

Step 1: Pre-Upgrade Preparations

Before you upgrade to v21, there are some mandatory steps that must be completed before running a full system upgrade to v21.

1. If your system is not on CM4D v20.3 or newer, follow the standard upgrade path to get your current system to Schema 20b/20b.
2. Request new CM4D Licenses for v21.
3. Backup your system, particularly Managed Documents.
4. Run the **Pre-Migration Analysis** tool (with v20, db schema 20b, BEFORE upgrade to v21).
    a. Unzip the v21 PreMigrator folder.
    b. Copy your Cm4d.4ds file to the PreMigrator folder.
    c. Run **v21PreMigrator.exe**.
        i. Set the Migration Export Path.
        ii. Click Analyze.
        iii. Edit the Managed Documents map file.
            (1) Set the User.
            (2) Set the Priority.
        iv. Edit the Report Paths map file.
            (1) Set the Depository Path.
            (2) Set the Depository Name.
        v. Click Re-Analyze in the PreMigrator.
    d. If no errors, exit PreMigrator Analysis tool.

Step 2: Upgrade Your System

Once you are sure that all settings in your map files are Valid and no errors were returned when analyzed by the v21PreMigrator Analysis tool, continue on to the full system upgrade to CM4D v21.

1. Upgrade ATS Licensing from 2.0 to 2.1.
2. Upgrade Installation from v20 to v21.
3. Upgrade Databases from Schema 20b to 21a.
4. Start Services.

Step 3: Execute the Migration

Once your system has been upgraded to v21, open SiteManager to execute the Migration.

1. Run SiteManager.
    a. Complete Migration via the S21A dialog.
        i. Select the Migration Export Path
        ii. Stage 1: Initialize Migration
        iii. Stage 2: Activate Migration
        iv. Stage 3: Post Migrate Cleanup
    b. Exit the Migrate S21A dialog.
2. Exit SiteManager.

Step 4: Post-Migration Cleanup

Run the Post-Migration Cleanup Script (for DBA's; optional).

About the Changes in v21

Beginning in v21, the way Managed Documents interact with CM4D Scheduler and CM4D Web (previously known as WTC) has been modified, so you must perform a migration of all Managed Documents and CM4D Scheduler jobs before you will be able to use them in v21. Standard documents are unaffected by this change.

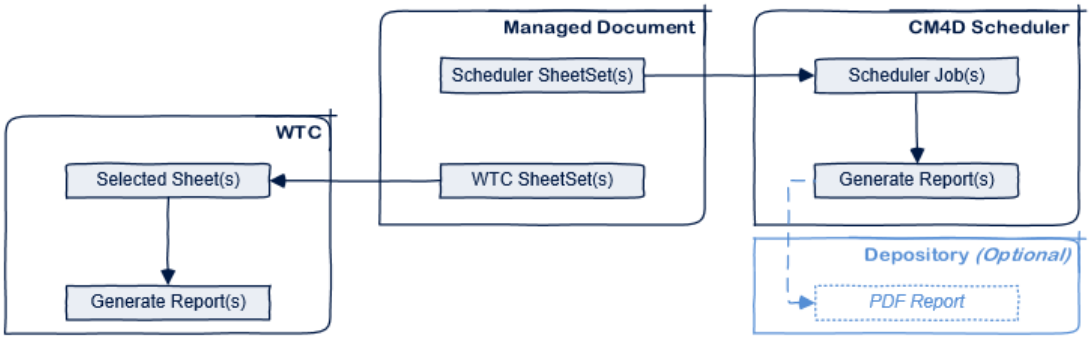
> ⚠ Although this Migration process poses very low risk to the system, you should still be sure to back up all Managed Documents as a precautionary measure before starting any part of this migration.

What the Changes Mean

This version will introduce some new concepts when dealing with reports in Scheduler and over the web.

In v20 (and earlier), the content of a Scheduler or WTC report was determined by the Managed Document used to print the report. The Managed Document contained SheetSets with either a Scheduler and/or a WTC flag set for printing.

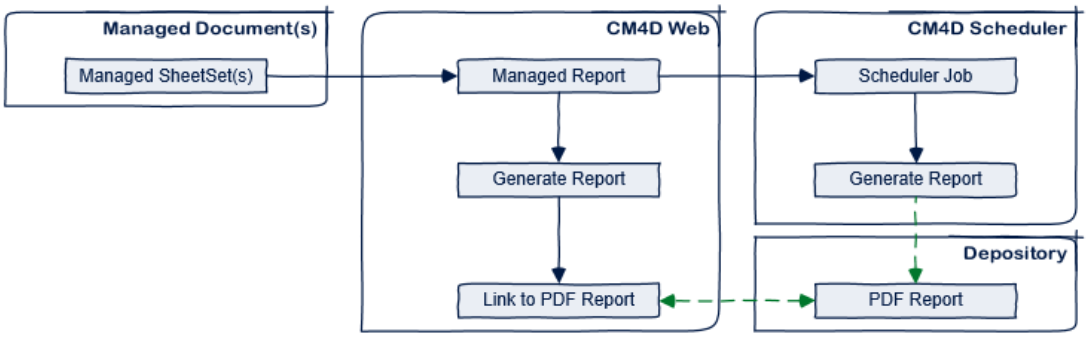
- Scheduler: A report would be printed for each Managed Document assigned to the Scheduler job, each report containing sheets flagged on the SheetSet for printing with Scheduler.
- WTC: A report would be generated containing the sheets selected from the list for a single Managed Document. This list of available Sheets was determined by which Sheets were in a SheetSet that was flagged for printing in WTC.



In v21, a report is now defined by the Managed Report assigned to a job in Scheduler or selected for printing in CM4D Web (the successor of WTC). A **Managed Report** is defined by the contents of one or more SheetSets, but it is not limited to a single Managed Document. It can be comprised of multiple SheetSets from different Managed Documents. The defined Managed Report allows Scheduler or CM4D Web to generate reports that combine SheetSets from multiple Managed Documents into a single PDF.

- Managed Reports are defined by one or more Managed SheetSets from one or more Managed Documents, and can be used by either Scheduler or CM4D Web.

- Scheduler: A report will be printed for each Managed Report assigned to the Scheduler job, each report containing all of the SheetSets that are assigned to that Managed Report. The order in which the SheetSets are printed is determined by the definition of the Managed Report.
- CM4D Web: A report can be generated on-demand from a list of available Managed Reports. You can also create a new Managed Report or edit an existing Managed Report. Which SheetSets are available to be assigned to a Managed Report is determined by the Managed flag being set on the SheetSet in a Managed Document.



How the Migration is Accomplished

The majority of the migration will be executed by several Scheduler jobs set up for you at the beginning the migration, but some pre-migration work is needed (see Pre-Upgrade Steps below) before you begin the migration.

This gives you the opportunity to fully analyze your system, make decisions about any changes you want to make, and prepare your system before doing the full shut-down, upgrade, and migration.

> See the topic v21 Migration Notes for recommendations, warnings, and other relevant information related to the v21 Migration process.

I want everything to run exactly as it does today - what is the minimum I need to do?

1. At a minimum, you will need to assign Users and Priorities for the Migration Jobs in the v21MigrationMapManDocs.txt file.
2. If you are not using Depositories, you will need to define those as outlined in the v21MigrationMapReportPaths.txt section below. If you are already using Depositories, then the v21MigrationMapReportPaths.txt file will be pre-populated and may not require any additional input. If you do receive any path errors when running the v21PreMigrator Analysis, however, check the file to be sure all Scheduler Jobs have a valid Depository assigned.

Step 1: Pre-Upgrade Preparations

Before you upgrade to v21, there are some mandatory steps that must be completed before running a full system upgrade from v20 to v21.

Steps to Complete:

- A. Get system up to CM4D v20.3 or v20.4, if not already current
- B. Request new CM4D Licenses
- C. Back up system
- D. Complete the Pre-Migration Analysis
  - i. Unzip the v21 PreMigrator folder
  - ii. Copy your Cm4d.4ds file to the PreMigrator folder
  - iii. Run the v21 PreMigrator Analysis Tool
  - iv. Set the Migration Export Path
  - v. Click Analyze
  - vi. Edit the Managed Documents map file
    - a. Set the Migration User
    - b. Set the Job Priority
  - vii. Edit the Report Paths map file
    - a. Set the Depository Path
    - b. Set the Depository Name
  - viii. Click Re-Analyze in the PreMigrator
  - ix. If no errors, exit PreMigrator Analysis tool

Current Version

Your system must be running at a minimum of v20 (Schema 20b) to run the v21PreMigration Analysis tool.

Licensing

CM4D v 21 uses a new version of the ATS Licensing Server and requires a new version of all CM4D license files. Contact support@ats-cm4d.com for help with license requests.

> You should request new license files to be used before upgrading to v21 to allow time for ATS to process your license request and deliver the files to you before you upgrade to v21.

Backups

Before testing and/or performing this upgrade, make sure to **back up all of your v20 Managed Documents and your Site/CM4D Databases before you upgrade to v21**, as the migration is irreversible.

PreMigration Analysis

Since all Managed Documents and Scheduler Jobs must be migrated before they can be used in v21, a special application has been provided to make the migration process as easy as possible. The **v21PreMigrator Analysis** tool will analyze your current v20 system to see what will need to be migrated, show you exactly what will happen with your Managed Documents and Jobs, and then allow you to make decisions on what you want the end result of the migration will be - all before shutting down the CM4D system and starting the upgrade and migration process.

There are several **required changes**, including:

- Creating and/or Assigning Report Depositories for Scheduler Jobs
- Assigning Scheduler Users to each Managed Document for the Migration Jobs
- Assigning Scheduler Priorities to each Managed Document for the Migration Jobs

Some **optional changes** may include:

- Re-organizing the structure of existing Report Depositories
  - Adding Report Sub-folders
  - Changing the folder location(s)

> ⚠ If you are changing the Depository to a new folder, and you will have Scheduler create the new folder for you during the migration process, be sure that the user running SiteManager has WRITE privileges in that location. Alternatively, you can manually create the new folders before running the migration.

  - Assigning a completely different Depository to a Scheduler Job
- Changing Report Names (by default, the current Managed Document label will be used as the Managed Report label)

All of these changes can be assessed before performing the actual upgrade to v21, thereby keeping the amount of system downtime to a minimum. Take your time to analyze the output map files that the v21PreMIgration Analysis tool generates, as the settings in these files will be used during the Migration.

> ⓘ The analysis process is non-destructive and does not require a full CM4D installation on the computer that runs the v21PreMigration Analysis tool. It can also be run from a Network location.

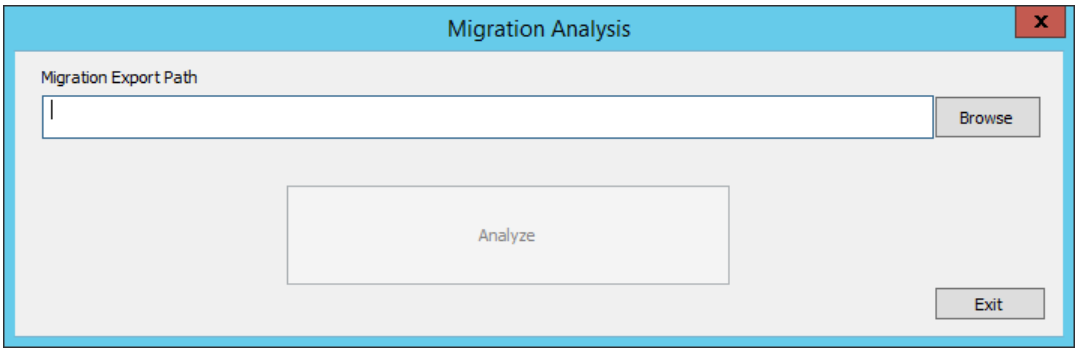
v21PreMigrator Analysis Tool

> ⚠ The v21PreMigration Analysis tool must be **run on a 20b database schema**, but it will not alter or interrupt your current CM4D system.

The **v21PreMigration Analysis** tool is provided only to help you prepare your system for the migration and upgrade, it will not change or interrupt your current CM4D system or functionality. This analysis must be run if you are upgrading to v21, and it requires some input, but you will also be given the opportunity to make some changes before the migration that may improve your systems' organization, if you choose to do so.

> 💡 The v21PreMigrator Analysis tool can be run on any system that can connect to the Site Database; it does not need to have a full CM4D installed.

The pre-migration analysis tool will create two "map" files that will look at your system, write out what you have to a file, and then you can edit those files to control how the migration will work. This process does not alter your current system and it can be run as many times as you want prior to migration, allowing you to make changes to the map files, re-run the analysis, make additional changes, re-run analysis, and so on.



The v21PreMigrator tool is a stand-alone tool that can be run on any computer in your network, as long as the following specifications are fulfilled:

Required:	Not Required (but OK if present):
Schema 20b Site and CM4D Database(s)*	ATS Licensing
Connection/Access to Site and Database(s)	Specific Site Manager Privileges
	A local CM4D installation

> ⚠ If you are running a version earlier than v20, you must first follow the applicable upgrade paths before you can upgrade to v21.

Migration Export Path

Set the folder in which the two output Migration Map Files will be saved once the Analysis is complete.

The folder selected as the **Migration Export Path** folder does not need to be a Shared folder, but it may be more useful. If the folder is shared, the Map files generated by the analysis tool can be opened for editing by other users within the network.

> Viewing and Editing these output map files in a program such as Excel is highly recommended.

Analyze

Running the v21PreMigrator Analysis for the first time will always result in errors. This is because you have to make decisions and modify both files before the Analysis can return a Valid status.

The two map files that result from this analysis will be imported into the Migrate S21A dialog after the system has been upgraded to v21. The two files ***must be completely validated before you update to v21*** and run the Migration tool, because the v21PreMigration Analysis tool cannot be run on a v21 database schema.

Re-Analyze

The Analyze button becomes Re-Analyze once the analysis has been run once and the two map files have been created in the Migration Export folder. Repeat as many times as you like. If you receive no errors and are satisfied with the migration maps, you are ready to continue on with the migration.

Clicking **Re-Analyze** will not overwrite any manual edits you may have made to the two map files, it will only add any missing information from your system that is not already in the file.

> Since the map files are an exact mapping of how your current system will turn in to the upgraded system, if you update your system and do not get those changes updated in the map files, your migration will have problems.

So if you do make changes to your system after running the v21PreMigration Analysis tool, you can get those changes to be included in the migration maps in one of two ways:

- If you are certain that no manual edits have been made to the map files, or at least not extensive changes that you need to keep, you can simply delete the two map files and start over if you make changes to your current v20 system. Then in the v21PreMigrator tool, use the **Analyze** button to create new map files with the latest system settings.
- If you have already manually edited a map file but have made some changes to your system that you want to be included in the map file, **delete only the rows for the changed information** and leave the edited rows that you want to keep as modified. Then in the v21PreMigration Analysis tool, click **Re-Analyze**.

Progress Log

While running the Analysis or Re-Analysis, the progress will be written out to a **v21PreMigrator.log** file in a Logs folder inside the PreMigrator folder. Check this log file periodically if you want to see if the analysis is still running. Once it is complete, the message "Finished Analyzing for Migration" will be written at the end of the log file (and the v21PreMigrator tool will pop up a message dialog).

Migration Map Files

The migration map files created by the v21PreMigrator contain specific information that will tell you how your migration will proceed. The file names for the text (tab-delimited) files are hard-coded and must not be renamed or saved in any other format. You can edit these files using any text file editor, but using a program such as Excel is recommended if you want to take advantage of the handy tools Excel provides for searching, sorting, and mass editing.

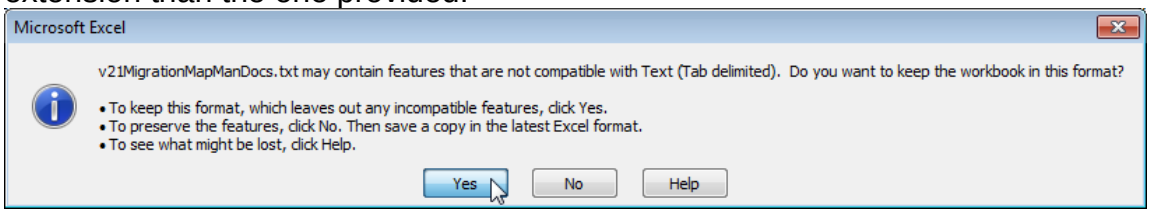
⚠ Sorting the rows using Excel functionality (even Formatting as a Table while working with the file in Excel) is acceptable, but **do not reorder the columns**.

The two files contain Column Headers, some of which have codes following the field label:

- **(I)** - Input. These fields display your current systems settings and configuration. These values must not be modified, or the analysis will be unable to recognize the item correctly, and you will end up with validation errors or a failed migration.
- **(O)** - Output. These fields display the content of what will be the result of the migration. Suggestions may be provided to you if a reasonable guess can be made, or if a reasonable suggestion cannot be ascertained, the field is left empty.

Be sure to save and close the map files before Re-Analyzing or Initiating the Migration.

⚠ Keep the original file format. Do not save these files with *.xls, *.csv, or any other extension than the one provided.



v21MigrationMapManDocs.txt

This file includes information about every Static and/or Dynamic Managed Document in your Site database. Workcell documents will not be listed in this file, as that type of Managed Document does not require mapping for the migration. If you have Workcell documents, they will be automatically migrated during Stage 1 of the Migrate S21A Tool.

Headers	Use	Action
Doc Type(I)	Indicates the type of document - Static, Dynamic, or Workcell.	System Input - do not modify
Path(I)	The location in which the document is currently saved.	System Input - do not modify
Site(I)	The Site Database that the document is saved in.	System Input - do not modify
Managed Document Name(I)	The current label of the document.	System Input - do not modify
Managed Report Label(O)	Will be the new label of the Managed Report. By default, this will be the same as the current label of the Managed Document. You may choose to change the label. ⚠ **The Managed Report Label must be unique within a Depository**. This analysis cannot guarantee that a Managed Document Label is unique, so for this reason you may end up with Report Labels that do not validate using the pre-populated values.	Pre-populated, but can be modified
Migration Job User(O)	Change this to a single user name. The Scheduler User that will be used to process the assigned migration priority job. The map file will be pre-populated with job users currently running Scheduler jobs will appear in the field. Your Site may have additional users with the Scheduler User privilege, but any user can run the Migration Jobs as long as the following conditions are met: • Access to the Site database that Manages the document • Windows Write permissions to folders (if creating Depositories) • **Scheduler User** and **Document Manager** SiteManager privileges	**Requires User Decision**
Priority(O)	The order in which the Managed Document will be migrated. The file will be generated with all available priority levels, and you must change the field to a value of	**Requires User Decision**

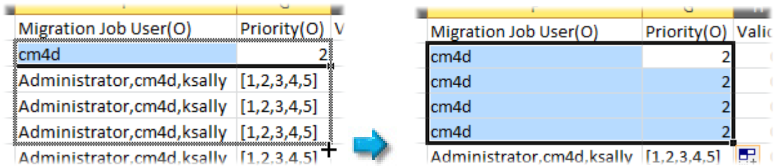
	1, 2, 3, 4, or 5. ⚠ The Priority assigned to a migration job does not correlate in any way to the priority of the original Scheduler job that a document may be connected to. This Priority is used only for the migration job. 1=Very High | 2=High | 3=Medium | 4=Low | 5= Very Low	
Valid	Indicates the status of the analysis. Until this field shows analysis was valid for the document row,you cannot continue with the Migration. ⚠ Do not upgrade to v21 until a Valid status (1) is achieved for all rows. 0=Invalid | 1=Valid	Message only - do not modify
Error Message	Message will indicate why the row did not pass validation. This could be because the Migration Job User and Priority has not been set. Once a valid status is returned for all rows, this field will be empty.	Message only - do not modify

Example:

Running the analysis for the first time will result in something like this:

Migration Job User(O)	Priority(O)	Valid	Error Message
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;Username "Administrator,cm4d,ksally" is not a valid scheduler user
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;Username "Administrator,cm4d,ksally" is not a valid scheduler user
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;Username "Administrator,cm4d,ksally" is not a valid scheduler user
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;Username "Administrator,cm4d,ksally" is not a valid scheduler user
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;Username "Administrator,cm4d,ksally" is not a valid scheduler user

Both the Job User and Priority columns are pre-defined with all options, and in all cases you must change all document rows to a single job user and a single priority. If you open this file in a program like Excel, you can change one row and then use the drag-replace tools for quick replacement of multiple rows.



Save and close the files, then click Re-Analyze in the v21PreMigrator tool.

Migration Job User(O)	Priority(O)	Valid	Error Message
cm4d	2	1	
cm4d	2	1	
cm4d	2	1	
cm4d	2	1	
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;U
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;U
Administrator,cm4d,ksally	[1,2,3,4,5]	0	Invalid Priority value!;U

v21MigrationMapReportPaths.txt

This file includes information about all of the Scheduler jobs in your Site database. If you do not use CM4D Scheduler, this file will be empty and does not need to be modified, but do not delete it from the Migration export folder.

The output Depository folders do not have to be the same as your current report paths and folders. This may be a good opportunity for you to check the existing structure of where your reports are stored, and if you are already using Depositories, how these might be re-organized using new folders and sub-folders.

However, if you leave the New Paths field values as they are pre-populated, your reports will be generated as they were before the upgrade. The only thing you would need to do then is add a Depository Name. This will create a new Depository that points to the report path you are already using. Just make sure that your Depository and Path combinations are unique. See the section v21 Migration Notes for more information on Depositories.

Headers	Purpose	Action
Job Name(I)	Label of the job as it appears in Scheduler Manager.	System Input - do not modify
Job User(I)	Username of the Scheduler user assigned to run the job.	System Input - do not modify
Job Document Count(I)	Indicates the number of Managed documents associated to the job.	System Input - do not modify
Path(I)	The current path of the Report, where the generated PDF is saved.	System Input - do not modify
New Path(O)	The path of the designated Depository, where reports will be generated after the migration. This path should be a UNC path to ensure access throughout your network. ⚠ Existing depository paths may not be a UNC path. You should change these to UNC paths, or some functionality may not work properly. ⚠ If you are changing the Depository to a new folder, and you will have Scheduler create the new folder for you during the migration process, be sure that the user running the migration in SiteManager has WRITE privileges in that location. Alternatively, you can manually create the new folders before running the migration.	Pre-populated, but **can be modified**
Depository Name(O)	The label of the Depository that the report will use. This may be empty if you have not set up any Depositories. May be empty at first, but must be defined to pass validation. If you enter a Depository that does not already exist, it will be created during the migration process.	**Requires User Decision** May be empty or pre-populated; pre-populated value can be

	See the topic v21 Migration Notes for more information on Depository requirements.	modified
Report Name Prefix(O)	This indicates a sub-folder of the “New Path”. Can be empty.	May be empty or pre-populated; pre-populated value can be modified
Valid	Indicates the status of the analysis. Do not upgrade to v21 until a Valid status (1) is achieved for all rows.	Message only; do not modify.
	0=Invalid / 1=Valid	
Error Message	Message will indicate why the row did not pass validation. Once a valid status is returned for all rows, this field will be empty.	Message only; do not modify.

If you do not have any Depositories, running the v21PreMigration Analysis tool would result in the Depositories or Report Name Prefix fields being empty, because the analyzer had nothing to compare to. So you would need to edit the **New Path** and **Depository Name** fields, entering information for labels of new Depositories you want created during the Migration and the folder path that the Depositories are pointing to. If a defined Depository doesn't already exist, it will be created in the specified location when the migration is initiated, so you need to be sure those folders are writable and use valid folder characters.

Example Use of Depositories and Prefixes:

If no Depositories have been previously defined, running the analysis would result in something like this:

Job Name(I)	Job Us	Jol	Path(I)	New Path(O)	De	Rep	Va	Error Message
Aerospace & Defense	cm4d	2	C:\CM4D Reports\Aero	C:\CM4D Reports\Aero			0	Depository Name is Empty
Automotive	cm4d	2	C:\CM4D Reports\Auto	C:\CM4D Reports\Auto			0	Depository Name is Empty
General Manufacturing	cm4d	2	C:\CM4D Reports\General	C:\CM4D Reports\General			0	Depository Name is Empty
New Schedule Setting 2	cm4d	0	C:\CM4D Reports	C:\CM4D Reports			0	Depository Name is Empty

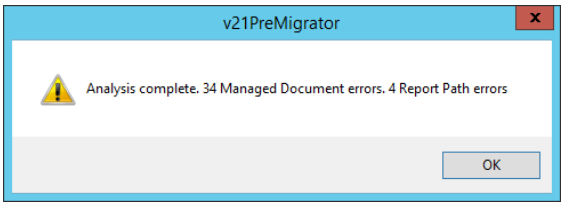
A convenient way to do this would be to go back and modify the Report Record Depositories in your v20 CM4D Scheduler Manager. If you were to create a new Depository called "Reports" that pointed to the folder "C:\CM4D Reports", running the re-analysis would look like this:

Job Name(I)	Job Use	Job	Path(I)	New Path(O)	Deposito	Report Na	Va	Erro
Aerospace & Defense	cm4d	2	C:\CM4D Reports\Aero	C:\CM4D Reports\	Reports	Aero	1	
Automotive	cm4d	2	C:\CM4D Reports\Auto	C:\CM4D Reports\	Reports	Auto	1	
General Manufacturing	cm4d	2	C:\CM4D Reports\General	C:\CM4D Reports\	Reports	General	1	
New Schedule Setting 2	cm4d	0	C:\CM4D Reports	C:\CM4D Reports\	Reports		1	

The analyzer is able to intuit certain information and configure some of the mappings for you. It recognizes that in the example above, the Depository path was a subset of the Report Path. So it mapped the Path as the root folder of the Reports Depository, then added the sub-folders as Report Name prefixes. This will not actually change where the reports are going to be saved after the migration is complete.

How to Perform the v21PreMigration Analysis

1. Copy the **v21PreMigrator** folder/zip file to the machine that will be running the analysis.
2. Connect to the CM4D database to be upgraded with one of the two following methods:
   - Copy a current **Cm4d.4ds** file from your current setup into the v21PreMigrator folder, or
   - Run DbConnect and manually enter the connection information.
3. Run **v21PreMigrator.exe**.
   a. In the Migration Export Path field, either type in or browse to the folder path where the migration export files will be created and saved.
   b. Click **Analyze**.
      i. The first time you run the analysis, every Managed Document will have an error. This is because there are decisions that you have to make for every Managed Document in the map file.
      ii. Report Path errors may not always appear, but if they do you must set up and/or assign Depositories before the analysis can be validated.



4. Browse to the Export folder and open the two map files. See the section Migration Map Files for more detail on the fields that need to be edited and what the settings are.
   - v21MigrationMapManDocs.txt - always requires decisions and editing.
   - v21MigrationMapReportPaths.txt - only requires editing if you use Scheduler and want to make adjustments to your current Depositories, or if you get path resolve errors.
5. Once you have made changes to the two map files, save and close the files. Do not change the format or extension of these files, and do not leave them open in Excel or any other editor or you will get an error from the read-only flags.
6. In the v21PreMigrator tool, click **Re-analyze**.
7. If you receive additional errors, or would like to make some changes to see what the outcome will look like, change the map files as you like and then click **Re-Analyze**.
8. Repeat as many times as you like. If you receive no errors and are satisfied with the migration maps, you are ready to continue on with the migration.

Continue to Step 2: System Upgrade.

Step 2: System Upgrade

> ⚠ Once you uninstall v20, you will no longer be able to run the v21PreMigration Analysis tool. Be certain that **all Pre-analysis and setup is complete and valid before uninstalling v20!**

Steps to Complete:

- ☐ A. Upgrade ATS Licensing from 2.0 to 2.1
- ☐ B. Upgrade Installation from v20 to v21
- ☐ C. Upgrade Databases from Schema 20b to 21a
- ☐ D. Start Services

At this point, you should be absolutely sure that all settings in your map files are Valid and no errors were returned when analyzed by the v21PreMigrator Analysis tool. Do not delete the two map files generated by the PreMigration Analysis tool (v21MigrationMapManDocs.txt and v21MigrationMapReportPaths.txt).

As with any upgrade, it is highly recommended that you back up your system before changing the version or updating your databases. With v21 in particular, you should back up all of your Managed Documents and your Database, in addition to the usual configuration files.

Upgrade ATS Licensing from 2.0 to 2.1

CM4D v 21 uses a new version of the ATS Licensing Server and requires a new version of all CM4D license files. Once you upgrade to the new ATS Licensing Server and CM4D v21, your 20.0 CM4D License files will no longer work. Contact support@ats-cm4d.com for help with license requests.

> 💡 If you are using **Named Licenses**, you should save all of your existing Machine Identifiers for each license that has Named Leases assigned, *before* uninstalling the Licensing Server to avoid having to reset them all from scratch.

1. Uninstall ATS Licensing Server 2.0.
2. Install ATS Licensing Server 2.1.
3. Import your new ATS CM4D v21.0 license file(s).
4. Add Named Leases manually as needed, or wait until the applications request licenses and approve them at that time.

See the ATS Licensing Server Manager documentation for information on some of the new features available in this version.

Upgrade Installation from v20 to v21

> ⚠ All PreMigration Analysis must be complete AND valid before you continue!

Follow typical backup and upgrade procedures, but in particular, make sure to back up all Managed Documents as these are particularly affected by this upgrade.

1. Uninstall CM4D v20.
2. Install CM4D v21.

Refer to the "*Installing ATS CM4D*" PDF as a general guide.

Upgrade Databases to Schema 21a

> ⚠ Beginning in v21, the Site Database will potentially get much larger due to new information now being stored in the Site Database. Please check that you have sufficient resources to accommodate this significant size increase.

Run the database update scripts provided with the v21 installation.

1. Run **UpdateSite21a.sql** on all Site databases.
   a. If you are using SQL Authentication, also run *Site Grant.sql* on your Site databases.
2. Run **Update21a.sql** on all CM4D databases.
   a. If you are using SQL Authentication, also run *Grant.sql* on your Site databases.

The Site Database 21a update script will result in Caution messages similar to the following. These messages are expected for this update and do not indicate a problem.

```
(1 row(s) affected)
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
(58 row(s) affected)
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
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Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
Caution: Changing any part of an object name could break scripts and stored procedures.
```

Start Services

The CM4D Scheduler and CM4D Launcher services need to be started before the migration can process. You may choose to wait until you have set up and activated the migration in the Migrate S21A dialog in Site Manager before you start the services. Either way, the services must be started for the Migration to actually proceed.

1. Go to Services.
2. Start CM4D Scheduler.
3. Start CM4D Launcher.

> If your Services are not starting, check to make sure that the CM4D Server license feature has been approved for a Named Lease in the ATS Licensing Server Manager.

You may also start the DataSmithBatch Service at this time. See the topic v21 Migration Notes for information on what will happen to new DataSmithBatch jobs while the migration is in process.

> Continue to Step 3: Execute the Migration.

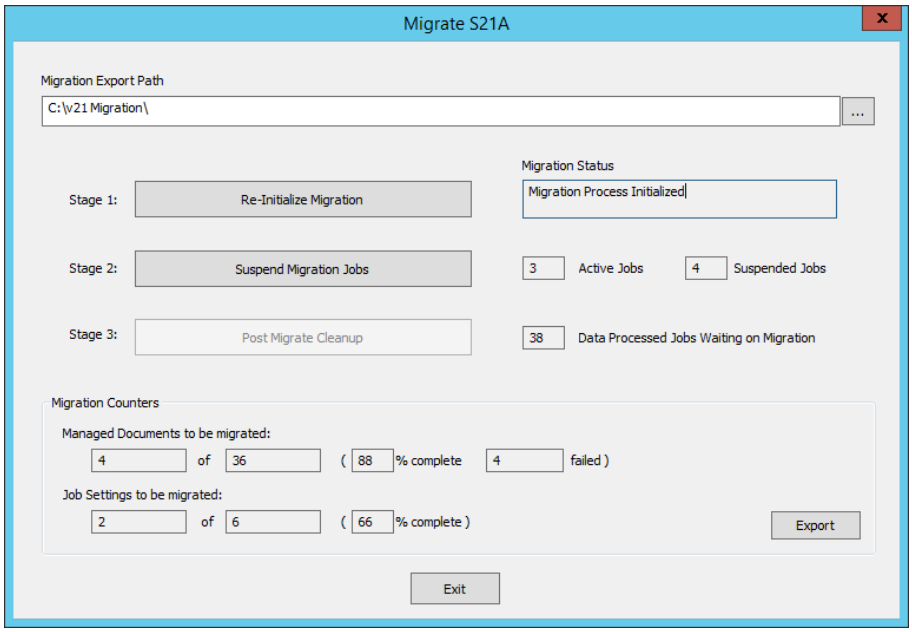
Step 3: Execute the Migration

Once your system has been upgraded to v21, open SiteManager to execute the Migration.

Steps to Complete:

- [ ] A. Select the Migration Export Path
- [ ] B. Stage 1: Initialize Migration
- [ ] C. Stage 2: Activate Migration
- [ ] D. Stage 3: Post Migrate Cleanup
- [ ] E. Exit the Migrate S21A dialog.

The **Migrate S21A** dialog is what executes and controls the actual v21 Migration. The first time that SiteManager is run after upgrading to v21, the Migrate S21A Tool opens automatically. This tool will open every time SiteManager is run, as long as you are still in Migration Mode. Once the final stage of the migration is complete, this dialog will no longer open. If at any time you exit the S21A dialog before you are done with the Migration, exit SiteManager and then re-run SiteManager. On re-open, the Migrate S21A dialog will be opened.



> If you have CM4D Scheduler Manager open at the same time that you are using the Migrate S21A dialog, you may not see things change or appear in the CM4D Scheduler Manager interface immediately. After using the Stage 1 or 2 buttons, click **Revert** on the Job Setup tab in CM4D Scheduler Manager to reload the job information from the Database, or **Refresh** the Job Queue tab to see the most recent information.

Migration Export Path

Browse to the Migration folder set during the v21PreMigration Analysis. This folder must contain the two map files you edited during the Analysis phase before upgrading to v21: **v21MigrationMapReportPaths.txt** and **v21MigrationMapManDocs.txt**.

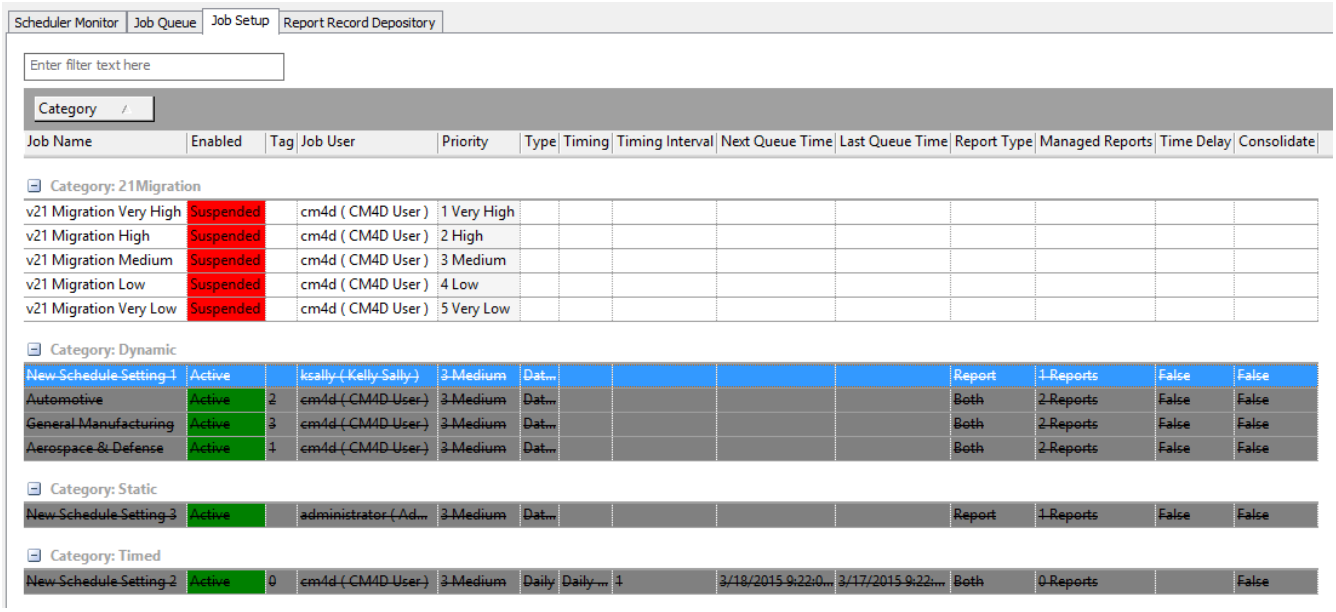
Migration Status

The Migration Status field will display messages about the various stages of the Migration as it runs. Each message is displayed at a specific milestone.

Message	What it means	Triggered by
Migration Mode Activated	You have upgraded your CM4D system and database(s) to v21. You are now ready to run the Migration.	Running the UpdateSite21a.sql script on your Site database.
Migration Processing Initialized	The two map files have been imported and analyzed by the Migration tool and the Migration jobs have been added to the CM4D Scheduler Manager. You can now Activate or Suspend Migration Jobs to carry out the migration.	Clicking the Initialize button.
Migration Processing Completed	All Managed Documents have been successfully migrated.	Old Managed Documents table is empty.
Migration Mode Closed	Post Migrate Cleanup has been run, indicating Migration is now done.	After Post Migrate Cleanup is completed.

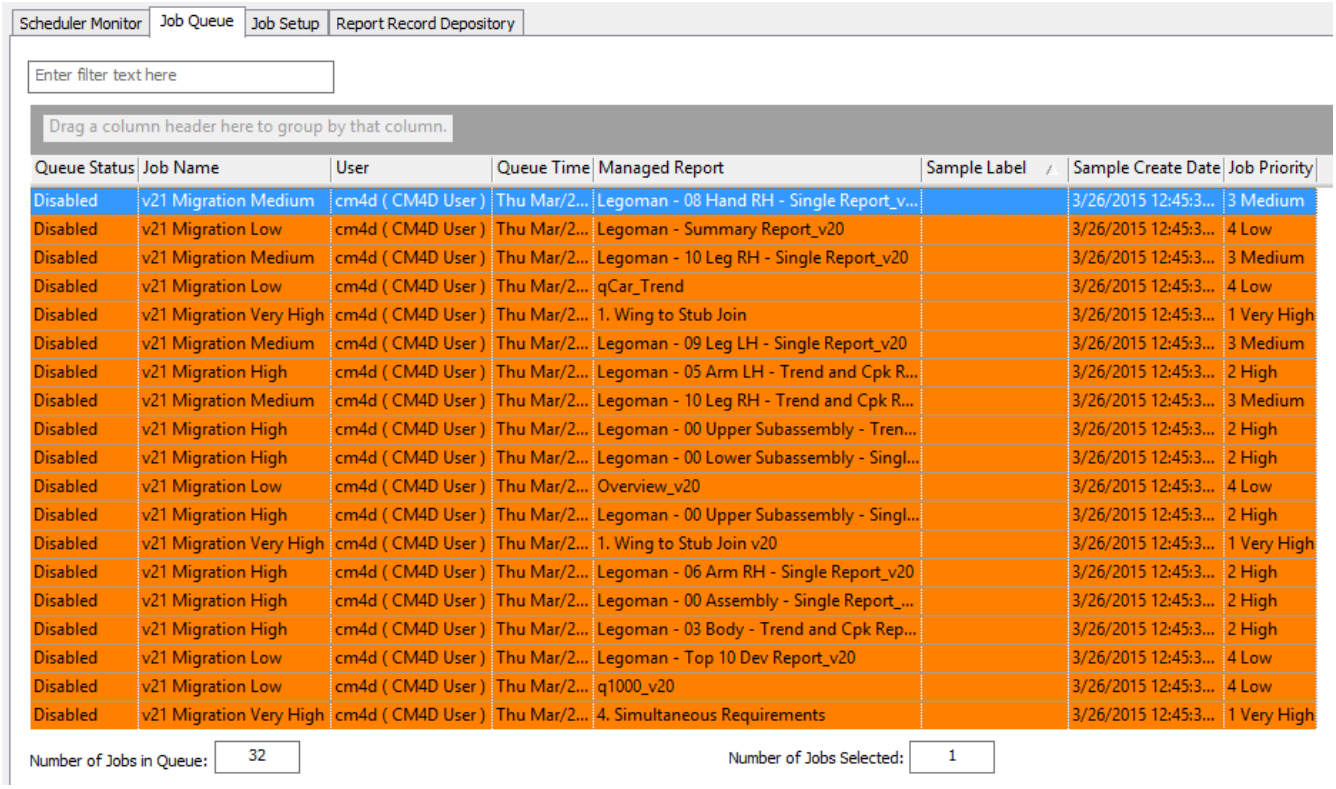
Stage 1: Initialize/Re-Initialize Migration

The first stage of the Migration imports the information from the two map files into CM4D Scheduler. The Migration Jobs are added to the Job Setup tab, the Migration jobs are sent to the Job Queue, and Report Depositories are put in the Report Record Depository tab. All existing Scheduler Jobs will be disabled in the Job Setup tab of CM4D Scheduler Manager. As the Managed Documents associated to the jobs are completely migrated, the jobs will come back online for processing.

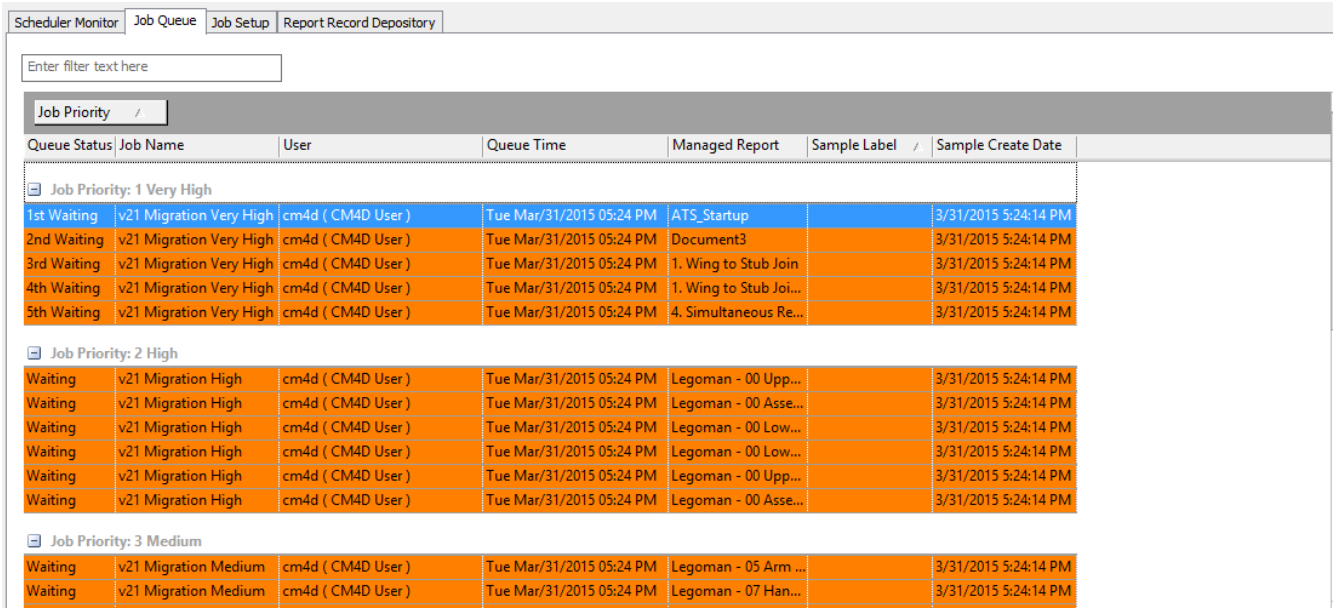


In the CM4D Scheduler Manager Job Queue tab, all Migration jobs will appear highlighted in Orange. If you do not see these right away, try clicking the Refresh button, or if you have Auto Refresh enabled, just wait for a few seconds.

- If you have not already started the Scheduler Services, these jobs will stay "Disabled" until you do so.



- If you started the Services before Initializing the Migration, the jobs will begin processing immediately.



Initialize Migration

Once you click Initialize Migration, the two map files generated with the v21PreMigration Analysis tool will be imported and analyzed by the Migration tool.

The Migration jobs are added to CM4D Scheduler Manager Job Setup tab and will be assigned Managed Documents, Users and Priorities based on the information you provided in the v21MigrationMapManDocs.txt file. The number of Migrations Jobs created depends on how you set up your Managed Document map file.

For example, if you have three Job users set to migrate documents using all 5 priorities, then you will end up with a total of 15 Migration Jobs in Scheduler Manager.

If a Priority is not used for any of the documents, then a Migration job will not be created for that Priority.

> If you have CM4D Scheduler Manager open before clicking **Initialize**, you may not see your Migration jobs in the Job Setup tab. Click **Revert** on the Job Setup tab in CM4D Scheduler Manager to reload the job information from the Database.

Existing PDFs with Report Records

If you were already using Report Record, then you will have Report Records in your database tables and PDF reports on your file system. If one of the following applies to your migration, take note of the way the migration will handle each case:

- **Change Depository Path** - if you choose to change the Depository Path in your map files as part of your migration strategy, any existing PDF reports will automatically be moved to the new path folder location. Keep in mind that you need to have WRITE privileges on the new folder (or on the folder that the new folder will be created in) for SiteManager to be able to move the files successfully.

- **Invalid Report Records** - if you have Report Records in your database table, but the actual PDF has been moved or deleted from the folder, the ReportRecord becomes invalid and will be removed from the database table automatically.

Re-Initialize Migration

Re-Initialize would be used if you make changes to your map files and want to use those changes for any Managed Documents that have not yet been migrated.

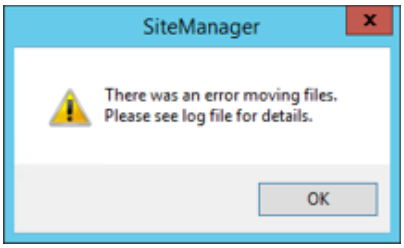
If a job is already processing when Re-Initialized, the job(s) will complete. Any queued "Waiting" jobs will be deleted.

On re-initializing, all Migration jobs will be removed and then re-added according to the information that is in the map files. The Migration Counter for Failed jobs will be reset to zero. Only Migration Jobs needed will be created, so if a Priority is not used for any of the remaining documents, then a Migration job will not be created for that Priority.

Jobs are recreated based on whatever information is in the map files, and the Migration Counter for Failed jobs will be reset to zero.

Failed to move files

You can also Re-Initialize if you have recovered/fixed any existing Scheduler Reports that failed to be moved to a new Depository location after the first Initialization. This can happen if files are open by another user, so make sure to close the file(s), then click Re-Initialize to attempt to move those files again. There may be other error condition possibilities.



Stage 2: Activate/Suspend Migration Jobs

This stage is where you can activate, or suspend, all of the Scheduler Migration jobs. You can change the status of individual Migration jobs in CM4D Scheduler Manager, but this button acts as a global toggle that will change the status of the Migration jobs to either all Active or all Suspended. The number of Active or Suspended jobs will be displayed in the two fields to the right of the Activate/Suspend Migration Jobs button.

> You can start your Scheduler and Launcher services before or after Activating the migration. What the Activate button does is change all of the Migration Jobs from Suspended to Active, so the Migration jobs will not process until those Services are running.

Activate Migration Jobs

When **Activate Migration Jobs** is clicked, all of the Migration jobs will go from Suspended to Active. If you manually change at least one Migration job to Active in CM4D Scheduler Manager (and Save the change), this button will automatically change to Suspend Migration Jobs.

Suspend Migration Jobs

When **Suspend Migration Jobs** is clicked, all of the Migration jobs will go from Active to Suspended. If you manually change all Migration job to Suspended in CM4D Scheduler Manager (and Save the change), this button will automatically change to Activate Migration Jobs.

> If you are seeing a lot of Failed jobs while the Migration is in process, you may want to Suspend the Migration and investigate the errors.

Stage 3: Post Migrate Cleanup

This button will not become enabled unless the following conditions are met:

- Documents to be Migrated = 0
- Job Settings to be Migrated = 0
- Data Processed Jobs Waiting on Migration = 0

Clicking **Post Migrate Cleanup** will remove all Migration jobs from CM4D Scheduler Manager. It will also empty all of the temporary tables that had been created for the sole purpose of this migration. These tables can be completely removed from the database with the Cleanup Script that will be provided (for DBA's) with the v21 installation.

Once Stage 3 is complete, Exit the Migrate S21A dialog. At this point, the Migration is complete, so once you exit the Migrate S21A dialog it will not re-appear when SiteManager is run.

Data Processed Jobs Waiting on Migration

While Migration Mode is active (and if the DataSmithBatch service is running), any new data that is added to the system for a Routine with the Data Processed flag set will be cached in a temporary queue. As Scheduler jobs have been migrated and come back online, the temporary job queue will be checked for any processed data that triggered a Scheduler Data Processed job. If so, that job will be sent to the Scheduler Job Queue for regular processing.

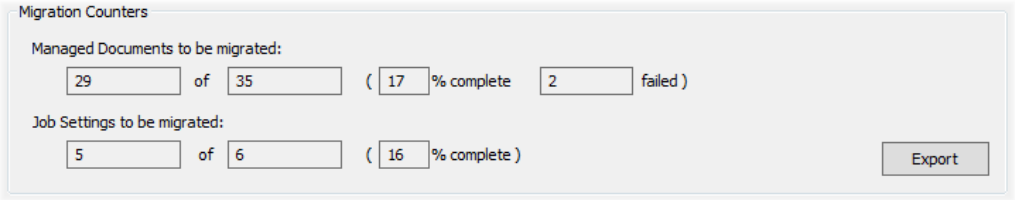
Until this number reaches zero, the Post Migrate Cleanup button will remain disabled. This counter is more of a status indicator than a counter, as the actual number here may be higher than the number of Data Processed jobs that will be Queued once your Scheduler Data Processed jobs have been migrated.

If the data does not need to trigger a job it will be discarded, and then the Post Migrate Cleanup button will become enabled. The jobs waiting on migration field will be checked on the same interval as the Retry Interval set for your DataSmithBatch, so if you have this interval set to a high number, you will see a longer delay between the completion of the Migration jobs and the Cleanup button enabling.

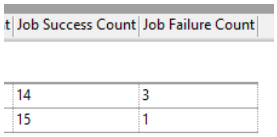
> ⚠ Data for Routines without the Data Processed flag that is processed by DataSmithBatch will not be affected by the Migration and will be put into the Database as usual. Only data that could potentially trigger a Scheduler Data Processed job must be cached so that a job can be queued as needed once the migration is done.

Migration Counters

The Migration Counters displays counts taken directly from the Database as the migration proceeds so that you can see some feedback on the status of the Migration as it processes.



The number of Successful/Failed jobs can also be seen in the Scheduler Monitor tab of CM4D Scheduler Manager.



t	Job Success Count	Job Failure Count
14	3	
15	1	

Managed Documents to be migrated:

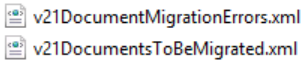
These fields provide feedback on how the Managed Document migration is progressing. The first field is how many documents are left to be migrated, and the second is the total number of Managed Documents that needed to be migrated. An overall percent complete is provided to help you gauge how long the entire process should take. A Failed field is provided to tell you how many Managed Documents have Failed the migration. Any failed documents will need to be analyzed to find out why they failed, so Export the feedback to help determine what documents failed.

Job Settings to be migrated:

These fields provide feedback on how the Report Path migration is progressing. The first field is how many Job settings are left to be migrated, and the second is the total number of Job Settings that needed to be migrated. An overall percent complete is provided to help you gauge how long the entire process should take.

Export Feedback

Saves current Migration Counter information about the Managed Documents as two XML files in the Migration Export folder:



Messages will include information about the migrated files the same as you would see in the CM4D trace window or the log files. If you have failed documents, the Migration Errors file provides information about the document so that you can go back and solve the issue and Re-Initialize.

How to Perform the Migration

1. Following the upgrade to CM4D v21 and running the Database update scripts, run SiteManager.
    a. In the Migrate S21A dialog, select the Migration Export Path (the folder set in the PreMigration Analysis tool).
    b. Click **Initialize Migration**, once it is enabled.
    c. Click **Activate Migration**, once it is enabled.
    d. Once the migration is complete, click **Post Migrate Cleanup**.
    e. Exit the Migrate S21A dialog.
2. Exit SiteManager.

Continue to Step 4: Post Migration Cleanup (optional).

Step 4: Post Migration Cleanup (optional)

A Post-Migration cleanup script will be provided for your DBA's to run after the migration is complete and confirmed successful. This cleanup script should only be run once the last step of the Migrate S21A Tool has been completed and a message appears regarding the cleanup script. When run, this database cleanup script will remove the temporary/scratch tables that were created solely for the purpose of the v21 Migration.

It is also recommended at this time that DBA's check for any tables with the suffix "_OLD_xx". These tables are remnants of previous migrations and can be safely deleted, although leaving these tables in the database will not harm anything.

v21 Migration Notes

Recommendations

Thread Counts

For the initial part of the Migration, double the number of Launcher Threads. This will get your Migration moving at a faster pace, and the system resources that are normally busy with CM4D processes will be idle until the migration has progressed anyway. After the crucial Managed Documents and/or Scheduler jobs have completed, you can lower the Thread Count to what you determine is a level that can be maintained once the migration is complete and the entire system is back online.

Threads are the CM4D Clients that are used to actually process the jobs, in this case, the Migration jobs. The more Clients that can be utilized, the faster the migration will go.

In previous versions, more than 2 or 3 Threads proved to be unstable. However, this instability has been solved in v21 so that there is now no limit to the number of Threads that can be set. The only limit is your system resources, so test out the Thread Count and find what the best performance is for your hardware for long-term use, but as far as the Migration is concerned, you can easily double the threads.

Bumping up the number of threads as long as you have the RAM/CPU to support them can dramatically increase the throughput of the system.

For example, if you currently run a system that has 6 servers running 3 threads (CM4D clients), you have 18 CM4Ds running reports. At the least, if you double your threads to 6, you then have 36 CM4Ds to run the Migration jobs. This will result in the migration being completed in a fraction of the time it would take if you left the threads as they are currently running, plus migration is faster to begin with, as the migration of documents is much quicker than it is when printing a normal Scheduler job.

Setting Thread Counts

To set the number of CM4D Threads you want to use, you need to modify the file **CM4DLauncher.settings**, located in the CM4D install folder for the system running the Launcher Service.

```
<?xml version="1.0" encoding="UTF-8"?>
<CM4DLauncherSettings serviceUser="cm4d" port="36057"
schedulerHostname="localhost" threadCount="2" clientResetDays="30.0"/>
```

Depending on the performance of your system, you can choose to leave the threads bumped up, or reduce them as needed to suit your hardware performance.

Load Balancing

One way to load balance for performance for this migration would be to distribute the jobs evenly between Scheduler users. And then use job priorities for each user to further define the order of the migration.

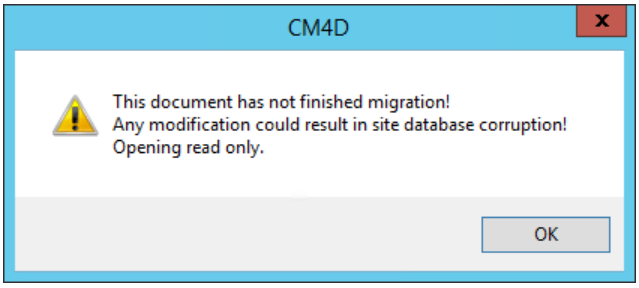
> ⚠ As general rule when it comes to Scheduler, do not use the same Scheduler User on different Servers, or you could end up with duplicate jobs.

Job Priorities

If you have a Scheduler job that needs to be run asap, you need to be sure that all of the Managed Documents attached to the job are set with a high priority, as the job will not reactivate until all of the managed documents connected to it have been migrated. Also, if the original Scheduler job has a low priority, it will not be processed until all migration jobs (or other Scheduler jobs) with a higher priority have been processed.

Warnings

- You cannot have duplicate Depositories. This applies both to duplicate Depository names, as well as duplicate paths assigned to different Depository names.
- If your Scheduler settings are changed after the map files are generated and you do not get those changes updated in the map files, your migration will have problems.
- While the Migration is in progress, Managed Documents cannot be opened. If a user attempts to open Managed Document while the migration is still running, they will get the following message in CM4D Classic, and the document will open as Read-only:



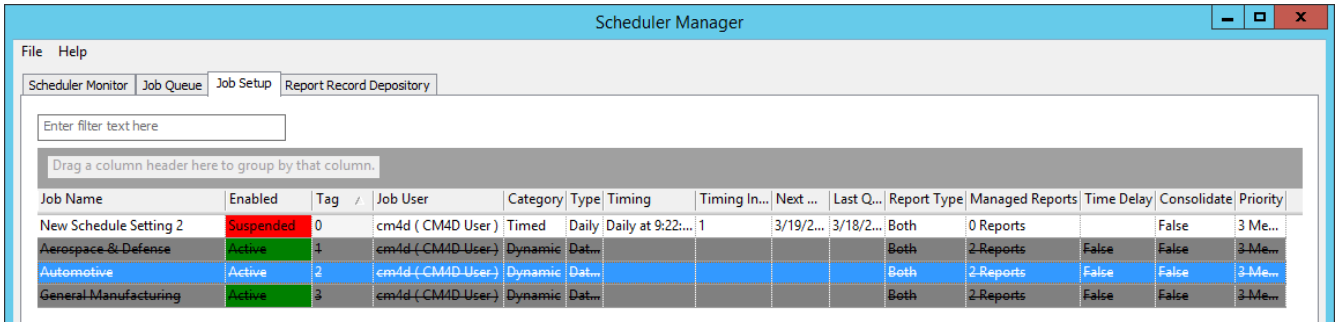
Scheduler Jobs

The migration process will change all existing Scheduler jobs. In this version, Report Paths, Report Names, and Managed Documents are no longer part of the Scheduler Job definition.

- A Scheduler Job will be defined by selecting one or more Managed Reports.
- A Managed Report is defined by a Depository and one or more SheetSets from one or more Managed Documents.
- The Depository is defined by the Depository Label and Depository Path.

Once you have upgraded to v21, but before the Migration has been run, all existing Scheduler Jobs will be grayed out (disabled) in the Job Setup tab of CM4D Scheduler Manager, and cannot be modified until they come back online. As the

Managed Documents associated to the jobs are completely migrated, the jobs will come back online for processing. If you have an existing Scheduler job that does not have any Managed Documents assigned to it, it will not appear grayed out or struck-through.



Report Depositories

A new concept to some in v21 is CM4D Scheduler Report Depositories. Although Report Record was first introduced back in v14, the use of Depositories was not required. Beginning in v21, however, Depositories have become mandatory.

> **What are Depositories?** Basically, a Depository is a defined network folder location for storing PDF reports generated by CM4D Scheduler. See the topic Report Record Depository for more information.

If you are not currently using Depositories, the v21PreMigrator tool will make it easy to begin using them. If you choose, the tool will simply create all the Depositories needed in order to let your Scheduler system work exactly as it currently does, without any additional setup by you.

Regardless of whether you are already using Depositories or not, the pre-analysis phase of the v21 migration would be a good time for you to take a look at your system and organize or set up Depositories that will be the best use for your particular setup.

Some basic rules about setting up Depositories in the map file:

- The same Depository Name cannot be set for two different folder paths.
- The same folder path cannot be set for two Depository Names.
- The Depository Name field must have a value.
- The Depository Name must have a valid label.
- The Depository must have a valid definition:
  - Unique Name & Path (combination)
  - Valid folder characters
  - Writable location (for both Scheduler Manager and Scheduler Job users)

DataSmithBatch Jobs

While the migration is running, what will happen to new DataSmithBatch jobs?

Once Migration Mode is Activated, any new data that comes into the system from DataSmithBatch that needs to trigger a Scheduler Data Processed job **will not be lost**.

While Migration Mode is active (and if the DataSmithBatch service is running), any new data that is added to the system for a Routine with the Data Processed flag set will be cached in a temporary queue. As Scheduler jobs have been migrated and come back online, the temporary job queue will be checked for any processed data that triggered a Scheduler Data Processed job. If so, that job will be sent to the Scheduler Job Queue for regular processing. If the data does not need to trigger a job, then it will be discarded before the Post Migrate Cleanup.

Normal DataSmithBatch processing of data is not affected by the Migration and will be processed into the Database as usual. Only data that could potentially trigger a Scheduler Data Processed job must be cached so that a job can be queued as needed once the migration is done.

Workcell Managed Documents

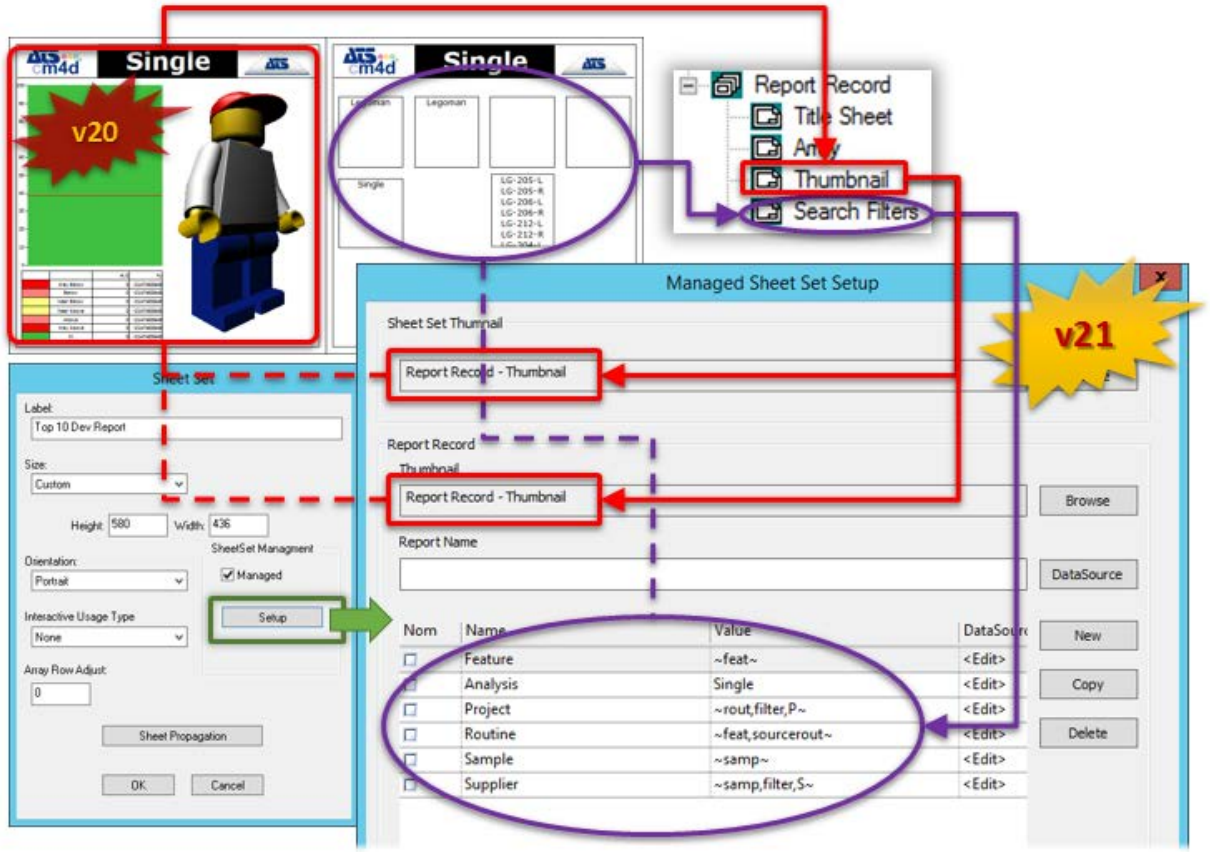
Managed Documents of the Workcell type will be migrated, but do not require any user mapping with the v21PreMigration Analysis tool. As a result, Workcell documents will not appear in the **v21MigrationMapManDocs.txt** map file, and when the migration is 17 in the S21A dialgo, those documents will be put directly into the new Managed Document database table.

Existing Report Record Documents

Will my Report Record documents be changed after the migration?

Yes, if you are already using Report Record Managed Documents that are set up according Report Record specifications, all of the settings will automatically be migrated to the new locations inside the SheetSet Properties of the Managed Document when it is opened in v21.

So in v20, you had to have a Report Record SheetSet with a Sheet for the Thumbnail and a Sheet for the Search Filters. All of this information will be moved inside the SheetSet Properties dialog after Migration. In v21, the Thumbnail sheet will be set as your original Thumbnail sheet. Your Search Filters will be copied into the SheetSet Management dialog as individual rows.



You may choose to remove the Report Record SheetSet entirely from your document once the migration is complete. However, if you do so, either move the Thumbnail Sheet to the SheetSet that is using it, or make sure to select a new Thumbnail in the Managed SheetSet Setup.

Installation Information

Installations

> ⚠ For the CM4D installation to be successful, the system must meet or exceed the minimum System Requirements.
>
> ⚠ The logged on user during installation MUST have local administrative rights on the PC.

CM4D Server Installation

The Server Installer is used for network Server installations that will be hosting automation services, applications, and/or databases that will be accessed from Client machines throughout the network. It includes the core CM4D products that are in the Client install, plus the automation services: DataSmithBatch, CM4D Scheduler, EventSmith, and WTC web reporting.

Typical use: Large network running Automation services, with multiple Clients connecting to the server for database access, document storage, and ATS licensing.

This type of installation is installed on a network Server and is licensed as a named Node-Locked License. CM4D Server is available as either a 32-bit or 64-bit program.

See the Server System Requirements for more information.

CM4D Client Installation

The Client installer is used for either a standalone workstation or a client system that will connect to a database or automation server on the network. It includes the core CM4D products - Classic (also Interactive and Workcell), DataSmith, DataUtility, DbConnect, and SiteManager.

There are three different configurations in which the same Client install of ATS CM4D is used:

- **Server Client** - A local CM4D installation that connects to a network Server for access to the CM4D database and ATS Licensing.
  - *Typical use*: Machines on the plant floor running CM4D Interactive or Workcell, connecting to the central server for its database and license. This could also be used for a CM4D Scheduler Client that is utilized by the server to automatically generate reports.
- **WTC Client** - A local CM4D installation that is run only via the WTC web interface. Although this configuration requires a Client install, the user will only access CM4D reports via the web.

- *Typical use*: Multiple users throughout the network, those with little knowledge of how to use CM4D, but need on-demand access to reports. ATS Licenses are generally obtained from a network server.

- **Workstation Client** - A self-contained instance of the Client install that has ATS CM4D, ATS Licensing, and the CM4D database all on the same machine. Generally, this is used when by organizations that do not have the Site Automation package or does not use CM4D widely throughout a large network to need shared databases.

  - *Typical use*: This configuration is usually the Node-locked CM4D Classic Developer and DataSmith licenses, and is used by report template developers and DataSmith translator developers.

This type of installation is installed on a non-server machine and is licensed as either a Concurrent or named Node-locked license. CM4D Client is available as either a 32-bit or 64-bit program.

See the Client System Requirements for more information.

Licensing

The **ATS Licensing Server** controls the licenses for ATS software applications, including ATS CM4D.

Clients can then connect to the Licensing Server, either locally or over a Network. For information on installing and running the ATS Licensing Server, please refer to the documentation installed with the ATS Licensing Server.

Version Compatibility

ATS CM4D	ATS Licensing
v20.0	2.0
v21.0	2.1

License Types

There are two types of licenses that are used with the ATS Licensing Server:

- **Named Lease**: A license that is assigned to a specific machine, and is reserved for use by that computer only. CM4D Server installations must use a Named Lease.
- **Concurrent**: A license that has a set number of connections that can be made by client machines throughout a network. These licenses are checked out at run-time, and if a license is not available, the module will not run.

Connect to a License Server

You can obtain a license from an ATS License Server Service, either on a local machine or a Network server, two different ways. Choose one of the following methods:

- **During installation** - enter the name of the ATS License Server in the field.

- **After installation** - to change the license server, edit the server name in the file **ATSLicensingServer.Client.dll.config**, located in the CM4D Installation folder (note the yellow highlighted lines).

```
<setting name="EndpointAddress" serializeAs="String">
```

```
    <value>net.tcp://licenseservername:8001/ATSLicensingServer/</value>
  </setting>
```

> ⚠ The Licensing Client config file should only be edited by the Network Administrator.

Configuring Licensing Clients

While the licensing client config file can use the default settings, there are options available for advanced configuration. For more details, see the topic Configuring Licensing Clients.

Backup License Server

Up to two additional license servers can be set up to be used as backup license servers in case the primary license server becomes unavailable. To assign backup servers, copy the address string (net.tcp://licenseservername:8001/ATSLicensingServer/) between the <value> attributes for the BackupEndpointAddress and BackupEndpointAddress2. Set each Backup Endpoint to each alternate license server name.

```
<setting name="EndpointAddress" serializeAs="String">
  <value>net.tcp://licenseservername:8001/ATSLicensingServer/</value>
</setting>
<setting name="BackupEndpointAddress" serializeAs="String">
  <value >CopyStringHere</value>
</setting>
<setting name="BackupEndpointAddress2" serializeAs="String">
  <value >CopyStringHere</value>
</setting>
```

Each alternate license server will need to be configured by importing licenses and assigning Machine IDs for Named Leases.

License Files

Unless you are using Concurrent licenses, Named Leases need to be assigned to the Modules and Features that CM4D will be using. Refer to the following list to determine which type of license should be used with which Module or Feature:

- **Modules** - The modules are the main applications of ATS CM4D.
  - CM4D Classic - Can use either Named or Concurrent licenses.
  - CM4D Interactive - Can use either Named or Concurrent licenses.
  - CM4D Workcell - Can use either Named or Concurrent licenses.
  - DataSmith - Can use either Named or Concurrent licenses.
  - Server - Must be a Named license. Includes the CM4D Scheduler module and the DataSmith Batch, EventSmith, and WTC Services. If you are running this license, you also need to have the Enterprise Module Option.

- **Options** - The module option require Concurrent licenses, which are checked at runtime and then released.
  - Beta - Allows you to run Beta (test) versions of the software.
  - Authentication - Allows you to create user groups and enforce user privileges within a Site database, using Site Manager to manage the levels of access of your Network users.
  - API - Allows you to use the internal CM4D API functions.
  - Enterprise - Allows you to run an Enterprise Installation (also referred to as a Server Installation), and all modules related to that install type. Required if you have the Server Module license.

Named Leases

If you are using Named Leases, you will need to assign **Named Leases** to license files in the ATS Licensing Server Manager. You can do this in two ways:

- **Approve Named Requests** - As a machine requires a license, it will send a request to the ATS Licensing Server. A License Manager can then simply go to the Named Requests dialog and either Approve the Request or Remove that request. If Approved, the machine that requested the license will be assigned a Named license permanently (or until it is removed by the License manager).
- **Assign Named Leases** - A License manager can manually assign Named Leases by entering the Machine ID's for each license. Run the Machine Identifier on the Client (the computer running CM4D) to obtain your Machine ID, then enter that ID in the Named Leases dialog for the license. That Named license will be assigned to that Machine permanently (or until it is removed by the License manager).

Upgrading an Installation

> If you are upgrading one or more major versions, please check to see if there are any Migration Guides relating to the version you are upgrading. Some version upgrade require specific migration steps in order to ensure proper system functionality.

An upgrade is done when there is a **major version** change, such as going from v16.5 to v20.0. Typically, an upgrade requires a new installation of CM4D and a schema upgrade for both the Site and CM4D DataSource databases. This is only a simple example and your local CM4D Administrator or DBA's should always be consulted.

> If there is a **minor version** change, such as going from v20.0 to v20.1, then you will typically only apply a software patch.

Upgrading CM4D Server

To upgrade a CM4D Server Installation, follow this general guideline:

1. Backup any existing CM4D database(s) that you will be upgrading to the new schema.
2. Backup the folder containing your current CM4D installation.
   a. Particularly, the following files:
      i. **CM4D.ini**
      ii. **CM4D.4ds**
      iii. **CM4DLauncher.settings**
      iv. **CM4DScheduler.settings**
      v. **DataSmithBatch.settings** (or **DataSmithSettings.batch** if pre-v19)
3. Stop the following application services:
   a. CM4D Launcher
   b. CM4D Scheduler
   c. DataSmith Batch
   d. EventSmith
4. Stop the following COM+ Components:
   a. EventSmith
   b. WTC
5. Stop the ATS License Server Service.
6. Uninstall the current version of CM4D.
7. Reboot your computer.
8. Run the installation for the version you are upgrading to

9. Upgrade your Site database schema (if required).
10. Upgrade your CM4D database schema(s) (if required).
11. License your new CM4D installation.
12. Reboot your computer.
13. Start the ATS License Server service.
14. Copy the backed up configuration files (4ds, ini, etc.) into the CM4D install folder.
15. Start your application services and web applications as needed.
16. Check DbConnect to make sure that you can still connect to the database.
17. Upgrade all CM4D Client systems (see below).

Upgrading CM4D Client

To upgrade a CM4D Client Installation, follow this general guideline:

1. Backup any existing CM4D database(s) that you will be upgrading to the new schema.
2. Backup the folder containing your current CM4D installation.
    a. Particularly, the following files:
        i. **CM4D.ini**
        ii. **CM4D.4ds**
3. Uninstall the current version of CM4D.
4. Reboot your computer.
5. Run the installation for the version you are upgrading to
6. Upgrade your Site database schema (if required).
7. Upgrade your CM4D database schema(s) (if required).
8. License your new CM4D installation.
9. Reboot your computer.
10. Copy the backed up configuration files (4ds, ini, etc.) into the CM4D install folder.
11. Check DbConnect to make sure that you can still connect to the database.

Upgrading a Database Schema

> ⚠ CM4D Database schema upgrades should only be performed by a Corporate IT Professional or DBA.

After upgrading a CM4D Installation, you may have databases from one or more schema versions back that you want to access. To access those databases, you need to migrate the databases to the latest schema version using the upgrade path(s) below.

> ⓘ Database scripts are included with each CM4D Enterprise installation, but you may also download them from our website.

Before you begin the upgrade process, you will need to answer the following questions:

Are you upgrading a Site Database?

1. **Yes** - Along with upgrading the CM4D Site database schema, you will also need to upgrade any CM4D DataSource databases that are managed by the CM4D Site database to the corresponding CM4D DataSource database Schema.

2. **No** - Upgrade your unmanaged CM4D DataSource databases to the correct CM4D DataSource database Schema.

Are you using Oracle or SQL Server?

1. **Oracle** - Please review the following recommendations before upgrading an Oracle database schema.

    a. When an Oracle database is created or modified, to avoid potential errors, the procedures should be compiled.

    b. A DB Administrator needs to review the scripts and the current tablespaces prior to execution of update scripts.

    c. Tables that have been renamed with OLD are not deleted by the update scripts, but should be deleted by the DB administrator after the migration has been validated.

    d. Prior to running an update that requires a table migration, ensure temporary and rollback table spaces have sufficient size to support the updates.

2. **SQL Server** - After all of the required Update scripts are run, you must run the Grant scripts to give the Public database role the appropriate privileges on any newly created objects.

What is the version of your current Database(s)?

1. **Single-Schema Upgrades** - If you are upgrading to the newest version of CM4D from the previous version of CM4D, you will only need to run the latest upgrade script(s) on your database(s).

2. **Multiple-Schema Upgrades** - If you are upgrading to the newest version of CM4D from a version older than one release, you will need to run all intermediate update scripts on your database(s) consecutively before updating to the latest Schema version.

> The required Schema version levels for a CM4D application and the upgrade procedure are also in the `ReadMe.txt` file that is included with each release.

How to Update a Database Schema

The following steps are a general guideline for upgrading your database Schema.

1. Backup existing database(s)
2. Determine current database Schema
3. Run update scripts
4. Check database connection

Backup Existing Database(s)

Before executing any update scripts on your database(s), it is very important that you create a backup of your existing database(s). Once you have confirmed that the backup process was successful and complete, continue on to the next step.

> You should always test an upgraded copy of your production database(s) in a test environment before upgrading your production databases to a new schema.

Determine Current Database Schema

All Schema upgrades must start with your current database Schema. If you do not know your current Schema, select your database type below to see instructions for finding the Schema version.

SQL Server

1. Run SQL Server Management Studio.

2. Expand **Databases > YourDatabase > Programmability > Stored Procedures**.

3. Find the stored procedure:

a. For a Site database - `dbo.SiteSchemaVersion`

b. For a CM4D database - `dbo.SchemaVersion`

4. Right-click on the stored procedure and select Modify.

a. Look for the string `@version =`

b. The Schema version will follow the equal sign in single quotes (e.g., `'19a'`).

c. Do not make any changes to the stored procedure.

5. Exit SQL Server Management Studio.

Run Update Scripts

To upgrade the CM4D Schema version that is used by the new version of CM4D, you must run the appropriate Update scripts in sequential order. The update scripts will be provided along with the CM4D installation when you receive your upgrade.

Upgrading a SQL Server Database Schema

Upgrading an Oracle Database Schema

> ⚠ If you receive any errors while executing an update script, you must correct the issue(s) before continuing to the next script.

Example SQL Database Schema Upgrade

To upgrade the Site Schema version from v14 to v19, run the Update Site scripts on the **Site database** in the specified order:

1. Run `UpdateSite15a.sql` to upgrade the Site database Schema from 14a (v14.1) to 15a (v15.1).

2. Run `UpdateSite16a.sql` to upgrade the Site database Schema from 15a (v15.1) to 16a (v16.1).

3. Run `UpdateSite17a.sql` to upgrade the Site database Schema from 16a (v16.1) to 17a (v17.1).

4. Run `UpdateSite18a.sql` to upgrade the Site database Schema from 17a (v17.1) to 18a (v18.1).

5. Run `UpdateSite19a.sql` to upgrade the Site database Schema from 18a (v18.1) to 19a (v19.1).

6. Run `Site Grant.sql` to grant the Public role the appropriate privileges on the newly created objects in the Site Schema.

To upgrade the CM4D Schema version from v14 to v19, run the Update scripts on the **CM4D database** in the specified order:

1. Run `Update15a.sql` to upgrade the database Schema from 14a (v14.1) to 15a (v15.1).
2. Run `Update16a.sql` to upgrade the database Schema from 15a (v15.1) to 16a (v16.1).
3. Run `Update17a.sql` to upgrade the database Schema from 16a (v16.1) to 17a (v17.1).
4. Run `Update18a.sql` to upgrade the database Schema from 17a (v17.1) to 18a (v18.1).
5. Run `Update19a.sql` to upgrade the database Schema from 18a (v18.1) to 19a (v19.1).
6. Run `Grant.sql` to grant the Public role the appropriate privileges on the newly created objects in the CM4D Schema.

> Refer to the topic Database Schema Reference to more information on upgrade paths and versions.

Site Schema Upgrade Path

Use the following upgrade path(s) to upgrade your Site Database(s). Starting with your current Site database Schema version, run each script sequentially until you reach the latest Schema version.

CM4D DataSource Schema Upgrade Path

Use the following upgrade path(s) to upgrade your CM4D DataSource(s). Starting with your current CM4D DataSource database Schema version, run each script sequentially until you reach the latest Schema version.

Check Database Connection

Once your database Schema has been upgraded, check that CM4D can connect to the database.

1. Run **DbConnect.exe**.
2. Click the **Test Connection** button.

If you have successfully connected to the database, your Schema upgrade is complete.

If you require further assistance, please contact ATS Technical Support: support@ats-global.com