

# Arius<sup>®</sup>

## 2020c

Release Notes and  
Installation Instructions



IT TAKES VISION

Information in this document is subject to change without notice. The software described in this manual is furnished under a license agreement. The software may be used or copied only in accordance with the terms of that agreement.

No portion of the contents of this publication may be reproduced or transmitted in any form or by any means without the express written permission of Milliman.

Milliman, Inc.  
3424 Peachtree Road NE, Suite 1900  
Atlanta GA 30326 USA

Tel +1 800 404 2276  
Fax +1 404 237 6984

[ActuarialSoftware.com](http://ActuarialSoftware.com)

© Copyright 2006-2021 Milliman, Inc. All Rights Reserved.

This document is the proprietary and confidential property of Milliman, Inc.

Arius® is a registered trademark of Milliman, Inc. All other trademarks are property of their respective owners.

---

## 1. Release notes

### RELEASE 2020c ADDS SEVERAL NEW CAPABILITIES

#### What's new in Arius Deterministic

##### 1. Interpolated Historical and External Factors

Do you have benchmark patterns, such as prior selections or industry data sets, that you would like displayed on your exhibits, but the data structures don't match? You can now select to interpolate these patterns by selecting the **Interpolate** checkbox found under the EXHIBIT OPTIONS | HISTORICAL FACTORS AND EXHIBIT OPTIONS | EXTERNAL FACTORS – VIEW dialogs. Arius will also now automatically *extrapolate* or *compress* tail factors appropriately. (Note that this could provide slightly different results in 2020c than in the prior 2020b system if you previously had defaults set to use the historical tail factor.)

You may need to select the **Save Current SDFs** button before rolling forward your project to make these historical factors sets are available in the new file.

For more information, see the *Displaying Historical Factors on Exhibits* and *Displaying External Factors on Exhibits* tips documents found in Arius under HELP | USER DOCUMENTATION.

##### 2. Enhanced Cash Flow Capabilities

We have made cash flow reporting more flexible to help address the needs of IFRS17 by allowing you to produce cash flows at a more granular period than your project files (quarterly cash flows from an annual development, for example). You can make this selection by modifying the **Age Increment** from the **Settings** button on any payment pattern array.

You can also automatically populate the payment pattern arrays by selecting the **Enable formula-driven payment pattern** option and selecting an extrapolation algorithm from the **Settings** button on any payment pattern array.

One additional improvement on our cash flow reports is that Arius ensures that any remaining claims get paid out over the next calendar period. This helps situations where you may have outstanding reserves on older claims beyond the point at which the payment pattern completes. (Note that this could provide slightly different results in 2020c than in the prior 2020b, wherein the system was not paying out the full remaining value in the next calendar period.)

For more information, see the *Cash Flow Reports* document found in Arius under HELP | USER DOCUMENTATION.

##### 3. Show/Hide Preview Pane

Do your Arius project files contain very large triangles? You can now turn off the collection view (the bottom right preview pane on the Arius desktop) by selecting the **Preview Pane** button in the top-right corner of your main Navigation window. This can provide quicker screen refreshing by reducing the processing resources needed to keep the display of numerous large tables updated in real-time.


## What's new in Arius Stochastic

You can now run your stochastic models using any Arius table as input (including user-defined tables). Under MODEL OPTIONS | TABLE MAPPER, select the Arius table that corresponds to the model's input fields.

For more information, see the *Stochastic Table Mapper* document found in Arius under HELP/USER DOCUMENTATION.

## What's new in Arius Enterprise

### 1. New project categories

Filtering projects is now even easier with **Project Categories**. You can customize your categories from the ANALYSIS | PROJECT CATEGORIES page within the **Arius Analysis Tool** module and assign one or more categories to your projects via the categorization icon  found in the upper-right corner of the ANALYSIS | PROJECTS page. For example, you can organize projects by department, team, or type of analysis. Categories are helpful when filtering projects to include in a batch process and within any Extract Table definitions.

### 2. Batch printing across projects

We have enhanced our automation capabilities by including a new task for **Export to PDF**. Select the projects you want to print from the ANALYSIS | PROJECTS page, select the **Export to PDF** task and **Run Task**. The system prompts you for a print list and, once the job is complete, you will find your PDF files all zipped and ready for you on the ANALYSIS | DOWNLOADS page.

### 3. New ability to extract cash flow reports

Do you need to extract cash flows for IFRS17 reporting or other regulatory requirements or downstream reporting? You can now do this within the reporting capabilities of the **Arius Analysis Tool** module. When creating your **Extract Table Lists** from the Enterprise ribbon within the Arius application, drag any of your Cash Flow reports to your table listing and include this list as part of your **Extract Table** definition. Arius extracts cash flows by exposure period and calendar period.

Note: All projects need to be re-saved back to the Arius Analysis database before the cash flows can be extracted.

### 4. Enhanced Direct Import now imports triangles

Arius Enterprise gives you avenues for importing all kinds of data, either via Triangles on Demand or the Direct Import feature. In addition to importing columnar and row data (e.g., selected development patterns), you can now also import triangular-type data. For example, this may be helpful for importing prior ultimate selections into the Historical Ultimate arrays within Arius.

## What's new in Triangles on Demand

### 1. New ADX capabilities

Triangles on Demand (ToD) now supports two data solutions: (1) our existing SQL-based solution for most typical insurance data sets, and (2) our newly integrated Azure Data Explorer (ADX) solution for larger or more complex data requirements. Microsoft's ADX is a fast, fully managed data analytics service for large data sets. ADX can improve the performance of data processing requests and advanced queries in databases of a billion or more claim records.

[Read more about ADX here](#) or speak to a Milliman customer support representative to learn more and decide if an ADX implementation is the right solution for you.

### 2. Enhanced AEUploader utility

The AEUploader utility now automatically splits large CSV files into smaller components prior to their upload to Triangles on Demand, improving the reliability of the uploading process.

### 3. Ability to manage Triangles on Demand Measure Mappers and save as file

Arius Desktop and ToD users can now save and load Measure Mappers on the Data tab, making it easier to share these settings across Arius projects.

For Arius Enterprise users, we have made it easier to manage and delete any ToD Measure Mappers that have been saved back to the Arius Analysis database, and you can now view them on the ANALYSIS|MEASURE MAPPERS page within the **Arius Analysis Tool** module.

## FIXES AND USABILITY IMPROVEMENTS IN THIS RELEASE

### Arius Deterministic

- Fixed an issue where the Annualized Premium method wasn't calculating properly when you compressed an asymmetrical file with a partial period
- Fixed an issue where cell notes on asymmetrical triangles were being cleared when you compressed rows and/or columns
- Modified interpolation algorithms to now account for Exhibit Type (Development vs Ratio) instead of making an assumption based on whether selected development factors were above or below 1.000
- Mid-January 2021 update: The original 2020c build #15611 was updated to build #15646 in January 2021.
  - Fixed an issue wherein the *InterpolateExponential*, *InterpolateInversePower*, *InterpolateLinear*, and *InterpolateWeibull* functions could produce inaccurate results when used in user defined methods, reports, and column arrays. They performed correctly in exhibits. The January release fixes this issue.
  - Addressed a situation when extrapolating Historical and External tail factors wherein the algorithm could improperly reaching 1.000 too soon. This might only happen in rare scenarios where the tail factors were < 1.000 for Development-type exhibits or > 1.000 for Ratio-type exhibits, and it has now been addressed.
- Mid-April 2021 update: Arius was updated to build #15746 in April 2021.
  - Fixed an issue wherein blank cells in a row of historical or external factors may be ignored, allowing non-blank factors to shift to the left to replace the blanks. This could affect your selections if these factors are set as defaults. This shift can happen in the current or prior version of Arius v2020c (#15611 or #15646) in any of the following cases: when a data file from a previous Arius version with blank cells is opened by Arius version 2020c; when a new diagonal is appended to an existing file in Arius v2020c; or when factors containing blanks are imported into Arius v2020c.

### Arius Stochastic

- Fixed an issue which caused an error message when opening a stochastic residual graph in a project where the FILE PROPERTIES | DATA STRUCTURE parameter for **First Exposure Period includes All Prior** is set to TRUE

### Arius Enterprise

- Enhanced the ANALYSIS | AUTOMATION **Status** page so you can now search and filter across your entire history
- Enhanced the **Audit Log** within the **Utilities** module to include more actions, such as Update Extract Tables, Direct Import and Load ToD data
- Added the ability to set a user as *inactive* from the **Users** page within the **Portal Management** module

## Triangles on Demand

- Your selection of ToD database now persists as you move through the system's various pages
- Fixed an issue where deleting many files of data loaded into the ToD database sometimes resulted in a time-out and the files were not fully deleted
- Fixed an issue where the ToD View Info page might no longer be accessible due to having exceeded a maximum data limit (e.g., over 2 billion records)
- We now provide an error message if you upload a CSV file containing non-ASCII characters (e.g., a long dash, etc.)

## FILE COMPATIBILITY

The 2020C system opens and functions with data files from any previous version of Arius.

*Any files created or saved in Arius version 2020c will not work with earlier versions of Arius, and as such, they cannot be opened by others on your team who do not have version 2020c of Arius.*

## TELEMETRY DATA

For purposes of future enhancement, Arius has the means to gather data on the use and performance of specific features as well as general usage statistics of the software. It does not have the ability to relate any such usage to specific users.

## KNOWN ISSUES IN THIS RELEASE

- In the Berquist Sherman Adjusted Incurred Method, the BSAdjInc function that back-fits to create the adjusted average case reserve triangle is not working accurately when the file's data structure is asymmetrical (e.g., length of exposure period > length of development period). The calculations are correct if you modify the file structure to result in a symmetrical file.
- When using ODP Bootstrap Weighted Models, exporting results to CSV will not work without some amount of weight given to the Paid Chain Ladder model in the earliest exposure period. As a workaround, you can give a miniscule amount of weight to the Paid Chain Ladder (smaller than 1/iterations will not impact your results).
- Currently, the new batch processing feature for Export to PDF within Arius Enterprise only works on Deterministic tables. If a Stochastic table or graph is included in the print list, you will get the error message *Failed to Export to PDF: Object reference not set to an instance of an object* on the AUTOMATION|STATUS page. You will need to remove these objects from your print list in order for your job to complete successfully.

Other known issues are described on the [Arius FAQs and Known Issues](#) web page.

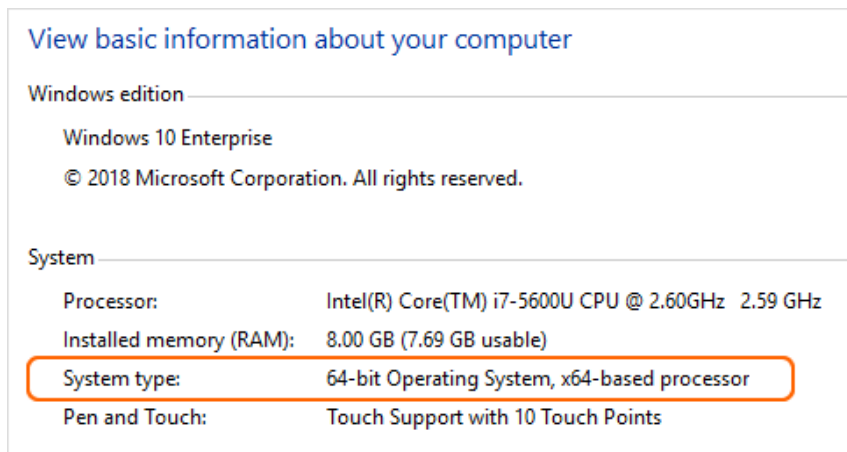
## 2. Installation requirements

System requirements for the basic Arius system are as follows:

- Minimum operating system: Microsoft Windows 10, 64-bit version
- Minimum hard disk space: 3.5 GB
- Minimum RAM: 1024 MB, though 2048 MB or more is recommended
- Related tools: Microsoft Office 2007 or newer (Arius does not support Microsoft Office XP). Arius and its API support both 32-bit and 64-bit versions of Microsoft Office. Arius requires the Microsoft .NET Framework 4.7.2 or newer and Microsoft Visual C++ 2017 Redistributable (x64). (Many Windows installations may already have this; you can confirm it at Control Panel | Programs and Features.)
- An Internet connection for license authentication at <http://admin.actuarialsoftware.com>

To assure that your Windows system is a 64-bit version (especially with older Windows 7 or 8) you can check your system:

Select **Start** and type **Control Panel**. Click on **Control Panel** and select **System**. You should see something similar to the window below.





### 3. Installation instructions for Arius Deterministic and Stochastic

**Note: Administrator privileges are required to perform this installation.**

In most cases, this is a multi-step installation process. You will:

- **Run the install program** for the new Arius software.
  - If there is already a version of Arius installed, the installer uninstalls that copy. This DOES NOT affect any existing data files.
  - If this is a new installation of Arius, it will likely also require an install of the MATLAB runtime.
- If you are directed to install the MATLAB runtime, once it completes, **re-run the Arius installer**.
- A note about moving from old 32-bit Arius to this newer 64-bit or vice versa:

The Arius install system automatically uninstalls existing Arius systems before installing its latest package. It cannot automatically do that

- when you upgrade from an old 32-bit version (3.2.1 or earlier) to this latest system, or
- when you downgrade from this latest system to an older 32-bit version (3.2.1 or earlier).

In either of those cases, you should first manually uninstall Arius via Control Panel. Go to START|CONTROL PANEL|PROGRAMS AND FEATURES and select Arius to delete it.

Anyone moving between 64-bit versions of Arius (for example, from Arius 2019b or 2020b to Arius 2020c) does not need to worry about uninstalling Arius as part of this process.

#### To install this software:

1. Close any existing version of Arius and all Excel workbooks before beginning the Arius installation.
2. Click the **Download** link and **Save** (do not Open) AriusSetup\_v2020c.exe onto your computer.
3. Locate the downloaded file. **Right-click on the EXE file and select Run as Administrator**. Most users will first need to download and install a newer copy of the MATLAB runtime system.
  - When prompted to download the MATLAB installation, select **Yes** to download the runtime files. (These files are large and will take several minutes to download.) The system downloads a ZIP file containing the MATLAB Installer.
  - Once downloaded, locate and open the ZIP file. Double-click setup.exe in the ZIP file and follow the instructions to install the MATLAB runtime.
4. You then re-run the AriusSetup\_v2020c.exe install. **Right-click on AriusSetup\_v2020c.exe and select Run as Administrator**.
  - You may also see the system installing the Microsoft Visual C++ 2017 Redistributable (x64) library. This is required for Arius 2020c, and if it is not present on your computer, the install routine installs it from the Microsoft downloads server.
  - Arius also requires that the Microsoft .NET Framework version 4.7.2 is installed with your operating system. This is likely the case for most users. However, if the installation routine detects that this is necessary, your IT team may need to download this from Microsoft and install it.

## 4. Additional information

After installation, the application is listed as **Arius** in your START | ALL PROGRAMS listing.

The system installs with five sample project files. They can be found at:

`C:\Users\<yourname>\Documents\Milliman\Arius\DemoFiles`

or perhaps displayed as

`Libraries\Documents\Milliman\Arius\DemoFiles`

- **Arius\_Sample.apj** – Sample data with 5 segments, a mix of short-, medium-, and longer-tailed lines of business. This file is intended to give you a sense of the system’s capabilities and a sampling of how the models can be set up with different assumptions for different lines. Note not all segments work with all models (like in the real world).
- **Arius\_Sample\_Canadian.apj** – Sample WC data for Gross, Net, and Ceded layers. This file includes sample user-defined tables for calculating the Reinsurance Provision for Adverse Deviation as described in the User Documentation *Canadian Provision for Adverse Deviations* and the section on *Calculation Across Layers*.
- **Arius\_Stochastic\_Sample.apj** – Sample data with 4 segments, showing a detailed implementation of all four families of stochastic models. This file is an updated version of the ODP\_Mack\_Hayne.apj file, revised as of Arius 2020b) to include the Generalized Linear Model.
- **Arius\_GLM\_Case\_Studies.apj** – Includes 5 different data sets or case studies to help explain the various ways the models can be parameterized to fit the sample data. This file accompanies the case studies in the back of the User Documentation *Getting Started with the Generalized Linear Model*.
- **Hayne\_Paper.apj** – Contains the data used in Dr. Roger Hayne’s paper on Maximum Likelihood Estimator approaches, *A Flexible Framework for Stochastic Reserving Models*.