




## **Release Notes**

*Tecplot 360 EX 2017 R2*

Tecplot, Inc.  
Bellevue, WA  
2017



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# Additional Resources

In addition to these Release Notes and HTML Help, Tecplot 360 includes access to these manuals (and an online forum) to help you explore all of Tecplot 360's functionality.

- [Getting Started Manual](#) Your introduction to Tecplot 360 EX includes a tutorial that will help you learn your way around the product.
- [User's Manual](#) This manual provides a complete description of working with Tecplot 360 EX features.
- [Scripting Guide](#) This guide provides macro command syntax and information on working with macro files and commands.
- [Quick Reference Guide](#) This guide provides syntax for zone header files, macro variables, keyboard shortcuts, and more.
- [Data Format Guide](#) This guide provides information on outputting simulator data to Tecplot file format.
- [Installation Guide](#) These instructions give a detailed description of how to install Tecplot 360 on your machine.

## My Tecplot

My Tecplot is Tecplot's one-stop portal that allows you to download software, manage your license keys, and more. Visit it at <https://my.tecplot.com/>.

# Welcome to Tecplot 360 EX 2017 R2

Tecplot 360 EX 2017 R2 continues our commitment to improving the power, performance, usability, and reliability of our industry-leading flagship data visualization product. While it's only been a few months since our last release, we think you'll be pleased with what we've been able to do in such a short time.

## What's New In Tecplot 360 EX 2017 R2

### PyTecplot 0.8.0

When introduced as part of Tecplot 360 EX 2017 R1, PyTecplot provided access to many frequently-used capabilities of Tecplot 360 EX, but not all. PyTecplot 0.8.0 is much closer to complete. If you need a capability that PyTecplot does not currently provide, please let us know at [support@tecplot.com](mailto:support@tecplot.com) to help us prioritize upcoming work.

New API coverage in PyTecplot 0.8.0 includes:

- Interpolate
- 2D and 3D vectors
- Streamlines
- View adjustments
- Contour and line legends
- 3D orientation axis
- Auxiliary data
- Node map, face map, and face neighbor information
- Solution time for transient data
- Slice extraction

The new included *tec360-config* script returns the paths required for setting `LD_LIBRARY_PATH` on Linux, simplifying the configuration of PyTecplot on Linux.

## FLUENT Loader Improvements

We've made many updates to this frequently-used loader, including:

- Significantly improved performance and reduced memory requirements for data with shared grids (typically time-dependent solutions).



In our test using a transient solution with 30 time steps of about 1 million data points each, time to first image fell from just over 74 seconds to under 4 seconds (a reduction of 95%), and memory use was cut by more than 90% (both compared to Tecplot 360 EX 2017 R1). Your results may vary.

- FLUENT Additional Quantities can now be loaded
- Variables in symmetry zones can now be loaded
- Variables that were previously imported as *Variable#1234* are now given proper names
- Increased responsiveness and progress feedback while reading FLUENT data

## Other Improvements

### • Q Criterion Calculation

The Calculate Variables function (on the **Analyze** menu) can now calculate Q Criterion—faster and more memory-efficient than using macros or equations to calculate the quantity.



In our test using a Plot3D data set with 5,800 zones and 263 million cells, calculating Q Criterion using Calculate Variables was more than six times faster than a macro we provide for the calculation (from nearly 47 minutes to 7 minutes and 20 seconds). Using a *.szplt* file further reduced the time required by 22%. Your results may vary.

- **Extract Precise Line**

The Extract Precise Line function has returned. It's now in the **Extract** submenu of the **Data** menu, rather than on the **Tools** menu.

- **Axial Rotation and Duplication**

2D and 3D grids can be rotated, and zones may be duplicated by repeatedly rotating them around an axis. This feature is commonly used in turbomachinery applications (for example, to duplicate blade rows). A 2D version of the rotation feature was in the legacy (non-EX) version of Tecplot 360.

- **Easier Frame Deletion**

It's now possible to delete the active frame using the Frame menu, or the frame's right-click context menu in the work area or the Frames sidebar.

- **Improved Font Support**

Greek text is rendered better, and the bold and italic tags in text objects now work with system fonts.

- **Choose Surface Generation Method**

When creating slices or iso-surfaces, you can now choose from two surface generation methods, to achieve smoother contours or to avoid holes in the surface. Look for this setting in the Other page of the Slice Details dialog and in the Style page of the Iso-Surface Details dialog.

- **Improved Animation Controls**

All animation features now use VCR-style controls. Previously, only some animation dialogs had them.

- **Easier License Installation**

The Licensing dialog now accepts a pasted single-user license key.

- **Incorporates Tecplot Chorus 2017 R2**

In Tecplot Chorus, the Group By feature in line plots has been replaced with the ability to use variables to define line color and symbol shapes, providing two levels of line groupings to help you better understand the trends in your data.

## **Tecplot SZL Server Improvements**

Our lightweight server for remote data access now:

- Much better performance with data sets with large numbers of zones



In our test involving a 681-million-cell simulation with 81 time steps accessed from Tecplot SZL Server over a SSH-tunneled connection, the time needed to open the file and display all time steps in sequence was cut in half, from 1737 seconds to 834 (compared to Tecplot 360 EX 2017 R1). Your results may vary.

- Supports two-factor authentication and password authentication for SSH connections
- Remembers the last-used directory
- Can load files from multiple directories

## **TecIO Improvements**

The TecIO library, provided to allow third-party applications to write Tecplot-format *.plt* and *.szplt* data files (and read *.szplt* files), now includes an easier-to-use API for writing SZL files. The new API supports 64-bit indexing, allowing individual zones to exceed two billion nodes. This API is also more flexible in the order in which it accepts data. Finally, the new API can write all supported Tecplot data types except bits, including integers of 8, 16, and 32 bits, instead of just 32-bit and 64-bit floating-point numbers.

## Bug Fixes

The following bugs are fixed in this release.

- Sporadic Mac hang when double-clicking buttons
- Corruption of auxiliary data when using Plot3D loader
- Contour levels would always reset to a single value after encountering a variable with a constant value
- Image export would fail on Windows when using Remote Desktop to a remote machine with an older (*c.* 2008) graphics card that does not support PBuffers
- Various clipping issues when exporting EPS files
- Data files with only custom labels or geometries could not be loaded (introduced in Tecplot 360 2017 R1)
- Some Star-CCM+ and FLUENT files would not load properly using the CGNS loader
- Could not load EnSight *.case* files with trailing spaces
- CFD analysis did not always use calculate on demand
- *Axis%* text size option was sometimes unavailable
- Crash with Probe to Create Time Series macro
- Layouts were not being saved correctly after toggling off Time Stands in the strand editor
- Solution time grid marker was not updating when stepping through time steps
- Several issues using calculated variables with SZL data
- Inefficient lookup of SZL variable values from macros
- Crash plotting surfaces of volume data using transient SZL data
- Crash in primary value contour flooding using a cell centered variable that is different than the cell centered variable used to define the iso-surface (SZL data)



## Platform Changes

Mac OS X 10.9 is no longer a supported platform. Mac OS X 10.10 or later is now required.

## What Was New In Tecplot 360 EX 2017 R1

If you missed our massive early-2017 release, the features below are new to you!

- **TecPLUS Replaces SMS, Brings New Features**

TecPLUS (which replaces the Software Maintenance Service) not only gives you all the benefits of SMS, it also provides you with the ability to use Tecplot Chorus, PyTecplot, and Tecplot SZL Server while your subscription is active. (New licenses include a year of TecPLUS.) For details, see [TecPLUS Subscriptions](#).

- **Variable Combining**

Variable combining (available in pre-EX Tecplot 360) has returned in an even easier-to-use form.

When loading multiple files in supported formats, you'll have the opportunity to tell Tecplot 360 EX which, if any, of the variables in these files have the same meaning by combining them.

Besides a new dialog that lets you combine variables interactively, you can create a variable alias file and combine pre-defined variables with a single click.

- **Set Slice Orientation By Selecting Three Points**

You can set the orientation of a slice either by entering the coordinates of three points on the desired cutting plane or by interactively probing the three points.

- **New Algorithm for Iso-surface Generation**

The MC33 algorithm is now used for deriving iso-surfaces, providing better visual results and improved performance.

- **Batch SZL Conversion**

Tecplot 360 EX can now be used to easily batch-convert your data files to SZL format (*.szplt*) for improved interactive performance. This capability does not require a license, so you can use it on, for example, a compute cluster without using Tecplot 360 EX network seats.

See Section 27-5 in the [User's Manual](#) for an in-depth discussion of batch conversion.

- **TecIO Can Now Read SZL Files**

The TecIO library, which has long had the ability to write both Tecplot binary (*.plt*) and SZL (*.szplt*) files, now has the ability to read SZL files. See the [Data Format Guide](#) for more information.

- **New Transient Tutorial in Getting Started Guide**

The Tecplot 360 EX [Getting Started Guide](#) now includes a transient data tutorial involving a vertical-axis wind turbine model with 127 time steps.

- **Incorporates Tecplot Chorus 2017 R1**

Tecplot Chorus 2017 R1 has movable columns in table views; loader descriptions for EnSight, OpenFOAM, and TRIX data files; and support for non-standard Tecplot-format filename extensions (*.dat* and *.tec*) used by some solvers.

For more information on these new features, see the Tecplot Chorus release notes.

In addition to these all-new features, Tecplot 360 EX 2017 R1 included numerous improvements to data loading:

- There is now a loader for the TRIX file format (an XML-based unstructured file format used by Cart3D and related solvers)
- The CGNS loader now supports CGNS formats up to version 3.3. CGNS Cases containing polyhedral

(NGON/NFACE) data and non-uniform meshes can now be loaded.

- The PLOT3D loader now supports continuation markers, allowing very large data sets to be loaded.
- The FLOW-3D loader now supports v11.1.2.7 files.
- The FEA loader can now load von Mises stress data from NASTRAN files. It also now correctly loads NASTRAN files containing both cell-centered and nodal variables.

Note that this latter change may cause layouts or macros to refer to the wrong variables; a warning appears when you load such files. To address the warning, re-create the layout or macro, or else update the style settings as necessary and change the !\$READDATASET instruction in the layout or macro to include the parameter "FEALoaderVersion" "436".

- Better support for loading data and other files from Unicode file system paths. Also, all text files supported by Tecplot 360 EX (including style sheets, variable alias files, layouts, macros, and ASCII data files) can now be read even if they include a Unicode byte order marker.
- All loaders can now open files directly from the Load Data dialog, and all have the ability to append data to your existing layout. Loaders without these capabilities (which included EnSight, Excel, HDF, and HDF5) have been upgraded to have them.
- A few data loading bugs have been fixed. The CGNS loader now reads 64-bit integers properly, allowing files written using a 64-bit version of the CGNS library to be loaded. And Tecplot 360 EX no longer crashes when loading a nonexistent recent file from the Welcome Screen.

## TecPLUS Subscriptions

As of January 1, 2017, TecPLUS replaces Tecplot's Software Maintenance Service (SMS). With TecPLUS, you get all the benefits of SMS, including:

- No-charge upgrades to Tecplot 360 EX during your subscription period
- Unlimited technical support
- One free hour of online training per year

Additionally, an active TecPLUS subscription gives you access to the following components, boosting your Tecplot 360 EX license to a whole new level of value:

- **Tecplot Chorus**

Our simulation analytics product for engineers who work with large numbers of cases. Previously, Chorus included Tecplot 360 EX to view individual cases' data files; we've flipped that, and now offer every Tecplot 360 EX user access to this powerful tool.

- **PyTecplot**

Tecplot and the Python programming language reunite! PyTecplot works with your system's installed Python and with popular Python tools like NumPy, SciPy, and Jupyter. PyTecplot features an easy-to-use object-oriented approach to working with your data and plots using the engine that powers Tecplot 360 EX.

- **Tecplot SZL Server**

When your data is too big to move around comfortably, you can install this lightweight server on most Linux hosts to quickly and securely access your remote data.

Your basic Tecplot 360 EX license is perpetual: even if your TecPLUS subscription expires, you will still be licensed to run any version of Tecplot 360 EX released while your subscription was active—forever.<sup>1</sup> However, your access to these additional software components (Tecplot Chorus,

PyTecplot, and Tecplot SZL Server) ends when your TecPLUS subscription expires.

Most Tecplot 360 EX users now receive a new license key annually, even those without TecPLUS. If you currently have a Tecplot 360 EX license with active SMS, you can receive a new license key that activates the TecPLUS features through My Tecplot or by contacting [sales@tecplot.com](mailto:sales@tecplot.com).

## Usage Data Collection

To help us better understand how our customers use our products and improve them further, Tecplot 360 EX includes an analytics feature that reports user activity over the Internet using the Google Analytics™ platform. This feature tells us which dialogs you use and which controls you manipulate in them. However, to protect your privacy and trade secrets, we do not see names associated with your data (such as variable, zone, or file names) or the actual values of fields in dialogs, nor do we receive any information about you or your organization's identity.

If you do not wish to participate in this program, turn off "Collect Anonymous Usage Data" in the Help menu.

We receive basic information about your operating system, product version, and license at each launch of Tecplot 360 EX, even if you have opted out of the usage data program. This information is not tied to any usage data collected.

No usage data of any kind is collected if you do not have access to the Internet or if the Google Analytics service is blocked by a firewall.

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1. While your license is perpetual, we cannot guarantee compatibility of today's Tecplot products with future systems.

## Key Features of Tecplot 360 EX

*Are you making the leap from Tecplot 360 to Tecplot 360 EX? Here's what you have in store.*

Launched in 2014 after more than two years of effort, Tecplot 360 EX is a substantial upgrade to previous versions of the product, with improved performance and ease of use compared to Tecplot 360 2013 and earlier.

### High Performance With Large Data Sets

Tecplot 360 EX 2014's subzone data format (SZL—say “sizzle”) reduces the amount of data that needs to be loaded for common operations, providing much better performance and lower memory usage for typical workflows on large data sets, especially over networks. These advantages require that data files be stored in SZL format (filename extension *.szplt*).

### Native Look and Feel

The user interface has been revamped using a modern UI framework (Qt) to provide a native look and feel for all supported platforms. Linux and Mac OS X users in particular should be pleased with this change, though Windows users will also see benefits.

The high points include:

- Dockable sidebars that can be attached in flexible ways to the main workspace, or even be positioned outside the workspace (e.g. on another screen)
- Right-click context menus and pop-up toolbars
- A more flexible toolbar with redesigned icons
- Sidebars for managing frames, pages, and macros and viewing probe results
- Redesigned Zone Style, Mapping Style, and Load Data dialogs, and smaller improvements to many others

- On Mac OS X, an X window server is no longer required to run Tecplot 360 EX since it is now a native Mac application

## Finding Familiar Features

Some commonly-used features are now available in a more convenient way than in Tecplot 360 2013 and earlier. For example, instead of using options on the Frame menu to change the order of frames, the new Frames sidebar provides this functionality (you can also right-click the frame border). Similarly, page management, which once required running macros provided in the Quick Macro Panel, can now be performed in the Pages sidebar.

The Paper Setup dialog, formerly found in the **Options** menu, is now in the **File** menu.

To copy an image of the plot to the clipboard for pasting into another application, simply select the frame using the mouse and choose **Copy** from the Edit menu. There is no separate **Copy Plot to Clipboard** menu command.

Many features can now be found in the context menu. Right-clicking almost any object in the Tecplot 360 workspace gives you quick access to commonly-used settings and actions that apply to that kind of object. These functions are not always available in other ways. For example, the Write Curve Points to File option, which used to be available through the Curve Information dialog found on the **Data** menu, is now accessed by right-clicking the actual curve in the workspace. Context toolbars are available for many situations, largely replacing the Quick Edit dialog.

## Omitted Features

For most users, the Tecplot 360 EX feature set approaches parity with the last legacy (non-EX) release of Tecplot 360, Tecplot 360 2013. Most of the remaining omitted features are used infrequently, if at all, by the vast majority of customers.

Most omitted features are supported via the Tecplot macro language, even if there is no user interface for the feature. Tecplot 360 EX fully supports loading layouts and macros that use these features. Therefore, a possible workaround for workflows that rely on an omitted feature is to record the operation in Tecplot 360 2013 R1 (or any older version) as a macro and play it back in Tecplot 360 EX, or to write the macro from scratch. You can add these macros to the Quick Macro panel for easy access.

Other omitted features include:

- Coordinate transform and shifting of pseudo-cell-centered data
- Depth blanking
- Surface clipping using slices
- The Quick Edit dialog (it won't be returning; see the new right-click context menus and toolbars)
- Image export in X3D, Sun Raster (RAS) and X-Window Bitmap (XBM) formats
- Animation export in Flash Video (FLV) format (SWF remains supported)
- Creation of HTML files for Web publication
- The add-ons Circle Stream, Code Generator, Compare XY Maps, Create Finite Element Sub-Zone, Distribution Plots, Export DXF, Extrude, Prism Grid, Sort, Statistics Calculator, Tecplot GUI Builder, Tetra Grid, and View Binary
- Curve-fitting add-ons ("extended curve fit") and power fit options
- Some options for changing the view and arranging the draw order of on-screen objects, though the same results can be obtained using available features
- The Group Select, Select All, Polar Drawing Options, Reference Scatter Symbol, and Print Preview dialogs



- The Journal and Sharing pages of the Data Set Information dialog
- The Constraint page of the Slice Details dialog, which allows a slice to be constrained by a bounding box
- Creation of 1-D line zones and zone creation by entering values

Third-party add-ons built for use with Tecplot 360 2013 or earlier are not compatible with Tecplot 360 EX. We intend to release an ADK (Add-On Developer's Kit), although we are unable to commit to a specific release date at this time. To request early access to add-on migration information, contact [support@tecplot.com](mailto:support@tecplot.com).

## Macro Compatibility Note

Macros and layouts created with previous versions of Tecplot 360 that create calculate-on-demand variables may not operate correctly in Tecplot 360 EX due to a change to the default value for the Connect Adjacent Zones setting in the Geometry and Boundaries dialog (on the **Analyze** menu).

This can be corrected by re-recording the macro in Tecplot 360 EX or by editing the SetGeometryAndBoundaries command in the macro or layout to explicitly specify ConnectZones rather than relying on the default value:

```

$!EXTENDEDCOMMAND
COMMANDPROCESSORID = 'CFDAnalyzer4'
COMMAND = 'SetGeometryAndBoundaries
  Axisymmetric=\ 'F\ ' SymmetryVar=\ 'Y\ '
  SymmetryValue=0 ConnectZones=\ 'F\ '
  NodeTolerance=1e-006 DefaultBC=\ 'Extrapolated\ ''

```

## Remote Display

Tecplot 360 EX with active TecPLUS subscription now supports the Tecplot SZL Server, a lightweight Linux server component that lets you access your data more easily from remote servers. If you are currently using remote display to

access remote data, you may find Tecplot SZL Server to be the better solution.

Linux systems can use X Windows to display Tecplot 360 on a separate system from the one on which Tecplot 360 is actually running. Your X display software must support the GLX OpenGL Extensions, or you must have the graphics rendered by the host CPU using the Mesa software renderer (`tec360 -mesa`).

Remote users may find performance better using remote desktop software instead of X. In our tests, the [HP Remote Graphics Software](#) was generally the most performant such solution for Linux.

On Windows systems, you can use the included Remote Desktop Connection utility, which transmits the entire user interface to a remote computer. This allows the rendering to be performed in hardware on the host computer and the results transmitted across the network. On server versions of Windows, more than one simultaneous session of this type can be supported. [ThinAnywhere](#) is a plug-in that can improve the remote performance of 3D applications over slow networks.

On Mac OS X, use the Screen Sharing feature, which can be enabled in the Sharing control panel (or a third-party equivalent such as Vine Server, which may provide better performance in some situations), and a VNC client, such as Chicken of the VNC. This supports a single user at a time.

Remote desktop software is generally not suitable for situations in which multiple remote users need to run GUI applications such as Tecplot 360 EX on the host system at the same time. In these situations, X on Linux is generally the preferred solution (though the clients can be other platforms).

## Crash Reporting

Please help us make Tecplot 360 EX better by sending a crash report to us in the event that the application terminates unexpectedly.

On Windows, Tecplot 360 EX creates a crash dump file. You will receive a message indicating that a crash dump file has been created. Click **Yes** in this dialog to open the folder where the file is created. You can then e-mail the most recent *.dmp* file in this folder, along with a description of what you were trying to do, to [support@tecplot.com](mailto:support@tecplot.com).

On other platforms, no crash dump file is created. However, we urge you to send us a report anyway with as much detail as you can remember.

If you have a moment and a desire to be extra helpful, please re-open Tecplot 360 EX and choose **Enable Diagnostic Logging** in the **Help** menu. Then redo the steps you took to cause the crash. Tecplot 360 EX will record your actions as a macro file. If you are able to reproduce the crash, send the resulting *.mcr* file to us (along with the *.dmp* file if you use Windows). On non-Windows platforms, you can find the *.mcr* file in `/usr/tmp/tecplot_${USER}/tpa_diagnostics`.

Crash dumps and diagnostic macros are stored in a temporary folder and will be eventually be deleted by the system. There is no need to delete them manually.

## Graphics Drivers

**For best results, please make sure that you are using the latest graphics drivers compatible with your hardware and operating system.** These can be obtained from your graphics adapter vendor's Web site. Old versions may have issues with Tecplot 360 EX, especially with larger data sets.

- **NVIDIA:** <http://www.nvidia.com/Download/index.aspx>
- **ATI:** <http://support.amd.com/en-us/download>
- **Intel:** <https://downloadcenter.intel.com/Default.aspx>

## Platform-Specific Notes

The following table outlines the support for various platform-specific features in Tecplot 360 EX 2017 R2.

	Linux	Mac OS X	Windows
FLOW3D loader	✓		✓
ABAQUS loader			✓
Excel Loader			✓
Tecplot Chorus	✓		✓
Tecplot SZL Server <sup>a</sup>	✓		

a. The SZL Server runs only on Linux, but Tecplot 360 EX running on any supported platform can connect to the server as a client

Refer to the remainder of this section for issues specific to your operating system.

### Windows

Your account must have administrator rights on your computer to install Tecplot 360 EX, or else right-click the installer and choose “Run as Administrator.”

### Linux

- **Ubuntu Linux**

With Ubuntu’s new Unity UI, minimizing Tecplot 360 EX may cause its pull-down menus to become unresponsive when the application is later restored. As a workaround, you may choose “Ubuntu Classic” or

“Ubuntu 2D” when logging in, or set your user account to use one of these as the default in the Login Screen control panel.

Tecplot 360 EX is supported only on LTS (Long Term Support) releases of Ubuntu.

- **Temporary Directory**

Tecplot 360 EX relies on being able to create temporary files in the system temporary directory. On Linux, this directory is typically `/usr/tmp` or `/var/tmp`. If your user account does not have permission to write into the system temporary directory, you can use a different directory either by setting the `TMPDIR` environment variable in your profile or by setting the `TEMPFILEPATH` in the `tecplot.cfg` file.

- **Menu Shortcuts**

Menu shortcut keys may not work if the `NUM LOCK` is on. You may set the `NUM LOCK` to turn off automatically at boot in your computer’s BIOS.

- **SELinux**

SELinux (provided with some Linux distributions) adds an extra layer of security. If you see this error message:

```
./bin/tecplot.shared: error while loading
shared libraries: ./lib/libtec.so: cannot
restore segment prot after reloc:
Permission Denied
```

Enter these two commands, replacing `/path/to/tec360/lib` with the actual path of your installed Tecplot 360 EX `lib` directory (your account needs `sudo` permission):

```
sudo chcon -v -R -u system_u -r object_r -t
lib_t /path/to/tec360/lib/
```

```
sudo chcon -t texrel_shlib_t /path/to/
tec360/lib/*
```

You can then run Tecplot 360 EX without disabling SELinux.

- **Remote Display Issues**

If you have a **Network** license, you can run Tecplot 360 EX on one computer and display it on a second computer (via an X server). The X server must support GLX extensions, or else you must use the `-mesa` option when launching Tecplot 360 EX to have all OpenGL rendering performed in software on the host. Working with large, complex files may benefit from the `-mesa` option (see next bullet) even if your X server supports GLX.

When displayed remotely, Tecplot 360 EX may exhibit substantially lower drawing speeds than when it is displayed locally, especially for text and geometries.

- **Mesa Rendering**

Mesa, an OpenGL-equivalent graphics library, performs 3D rendering in software. It is typically used when hardware acceleration is unavailable or when working with remote display of large data.

The Mesa version of Tecplot 360 EX is slower, especially for 3D plotting. If you must run the Mesa version and display remotely, you can speed up the rendering for XY Line and 2D plots by setting the environment variable below. On some machines, this may also improve the speed of 3D plotting that does not use translucency. (Mesa translucency performance is known to be very bad.)

```
export MESA_BACK_BUFFER=Pixmap
```

## Mac OS X

- **Keyboard Shortcuts**

Previous versions of Tecplot 360 used the Control key for most keyboard shortcuts, rather than the Mac standard Command key. Tecplot 360 EX changes these shortcuts to use the Command key under Mac OS X.

Similarly, when rotating a 3D plot, you now hold down the Command key while dragging with the right mouse button.

Note that the Alt key may be called Option on some Mac keyboards.

- **Right Mouse Button**

If your Mac's mouse has only a single button, hold the Control key while clicking to access right-click functionality.

- **Middle Mouse Button**

There is no functionality in Tecplot 360 EX that *requires* a middle mouse button; however, it does provide some shortcuts. Users of single-button mice cannot emulate the middle button, but users of mice with two buttons can hold down Control while right-clicking if their mouse does not support a true middle-button click.

- **Remote Display**

As Tecplot 360 EX uses the native Mac OS X user interface on the Mac, you cannot access the application on a remote workstation using an X window server. Instead, use the Screen Sharing feature in the Sharing control panel (or a third-party equivalent such as Vine Server, which may provide better performance), and a VNC client, such as Chicken of the VNC.

Since Tecplot 360 EX is not an X application under Mac OS X, it is not possible for multiple users to run Tecplot 360 EX on a Mac OS X host remotely.

Enjoy Tecplot 360 EX 2017 R2 and master the view!