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TreeTop Release Notes

TREETOP 7.1.2882.0
FEBRUARY 17TH, 2025

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A Better World
Tomorrow.

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TreeTop 7.1.2882.0 (February 17th, 2025)

This release of TreeTop addresses a bug in the macro execution timing for Tornados. We recommend that users that are using Excel VBA macros update to this version of TreeTop.

Excel VBA macros that were set to be executed *Before Calculation* were executed before all substitutions had been performed. This was inconsistent with the identically worded macro timing on trees.

The macro execution order on Tornados is now much more closely aligned with tree node macro execution settings. All substitutions are made, then the *Before Calculation* macro, if any, is executed. This is followed by the calculation of the model. Lastly the *After Calculation* macro, if any, is executed.

To take advantage of the different Tornado timing, simply switch to manual calculation mode and Reset / Recalculate the entire project.

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TreeTop 7.1.2880.0 (January 2nd, 2025)

This release of TreeTop is a re-release of version 7.1.2873.0 with an additional bug fix.

When re-linking a different version of an Excel workbook to an existing TreeTop file, linked probability cells would sometimes not be updated correctly to point to the new workbook.

TreeTop 7.1.2873.0 (December 6th, 2024)

This release of TreeTop includes a new *Add Nodes* panel as well as a number of quality-of-life improvements that have been suggested by the client base in addition to several bug fixes. We recommend that users update to this version of TreeTop.

New Add Nodes Panel

We have added a new simplified "Add Nodes" panel layout that combines the classic "All" and "Append" panels. To access this panel, go to *Options – Tree* and change the option under *Add Nodes Toolbox Panel*.

Trees

After creating a decision tree with the Value of Information tree wizard, the node properties *VOI / Delta* section's *Base Branch* drop-down did not refresh correctly until unselecting and reselecting a node once.

Very rarely, TreeTop would not show the *Substitution Target* range when multi-selecting nodes that had the same range. Changing tabs to a different tree and coming back would then allow the multi-selection and multi-editing operation. This was a refresh issue that has been fixed.

Tornados and Tornado Comparisons

The tornado or tornado comparison title has been added to the chart, in addition to the metric. This removes the need to manually add the title to presentation slides.

The tornado comparison legend line breaking has been reviewed. It is now significantly more intelligent and takes both title lengths and available screen real estate into account to avoid shortening of titles in many situations, whilst being more compact in other scenarios with short titles.

When using extremely long metric names, the tornado editor could show quite small cell picker boxes.

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Sensitivities

When creating sensitivities from tree, there could be a display problem if the user was currently viewing the Joint Probability metric, since sensitivities do not support this metric. If this happens now, the first valid metric is shown instead.

Updating sensitivity axes titles did not always immediately change chart captions.

The sensitivity heat-map legend could compute the wrong mid-point value. Note that this was a display bug with legend labeling only.

One-way sensitivities now show hover-data when in decision policy plot mode. This works if hovering anywhere over the chart background but may sometimes not work when hovering directly over a data point marker.

Excel and Windows Interoperability

We have added better error handling with user messaging when Excel start-up problems occur.

TreeTop is now much more resilient to blocking dialogs etc. whilst picking ranges.

If a named range has been moved, TreeTop now places the cell picker in a much more correct location than previously to reduce confusion.

TreeTop now records much more detailed diagnostic log messages if macro failures occur.

We have increased time-out and added crash avoidance code in multiple hot spots where it was possible to recover from communication failures due to high system loads etc.

Screen Capturing

We have added 16:9 aspect ratio screen capturing and changed the labeling to make this clearly distinguishable from the already present 16:10 aspect ratio capture.

Initial Metric Configuration

We updated the out-of-box metric configuration to be NPV, Cost and IR (defined as NPV / Cost). Previously, the initial setup was Revenue and Cost. There was no ratio metric defined.

This does not impact existing projects. The change is only visible to users that have not configured and then saved a metric setup in the past, and where there is no metric setup distributed as part of an internal installation script.

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TreeTop 7.0.2813.0 (June 26th, 2023)

Released as 7.0.2806.0 on June 8th. Re-released with additional bug fix.

This release introduces multiple instances of TreeTop to be open at the same time, as well as a number of minor improvements and bug fixes.

Support for Multiple Instances of TreeTop

TreeTop now supports multiple instances running in parallel. To run multiple instances, a new instance of TreeTop must be launched manually by the end user. This can be done, for example, by launching an additional instance of TreeTop from the Start Menu or by double-clicking on an additional TreeTop file in the Windows File Explorer.

Opening a Project from within TreeTop will close the current project, if one is already open. I.e., this will not launch a new TreeTop instance.

This model of supporting multiple instances adds a little bit of additional memory pressure, because the TreeTop application is started up multiple times. The advantage is that Windows takes over the task scheduling – potentially assigning a different processor to each TreeTop / Excel set.

Normal Windows conventions apply for working with software where each instance is a separate process. In particular, changing *TreeTop Options* only applies to the current instance; changes options are written to the system upon application close and apply to newly launched instances after that. Note that each instance writes settings upon closing – potentially overwriting changes from a previously closed instance.

Tornado Performance Improvements

We have significantly improved the performance of the Tornado editor as well as the Tornado range wizard. The performance issues only impacted usage scenarios where 80 or more variables were selected.

Calculation Performance Improvements

Manual calculation runs of trees and documents based on trees (range of value curves and sensitivities) are significantly faster now.

Minor Changes and Bug Fixes

The two-way sensitivity chart datapoint pop-up description now contains an indication of VOI / Delta mode, if this mode is active; this is parallel to the behavior of axes labeling for sensitivities.

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Chart tick-mark labels (sensitivities and range of value curves) could be cut-off under rare circumstances.

Tornado charts did not apply quick changes to the number of decimals immediately for the in-bar rendered results.

Manual Tornados could cause a crash in the Tornado to tree wizard if the input information was not supplied.

A crash could occur very rarely when working with game trees where the logic nodes had three or more choices and were edited multiple times.

Deleting variables from the second dimension of a two-way sensitivity would not delete from the second dimension. Variables were deleted from the first dimension instead, without updating the user interface.

Reset of sensitivities did not fully reset results prior to calculation in scenarios where the underlying tree was built using tree links to connect sub-trees. [v2813]

For a very specific value of information tree setup, the *Edit Probabilities* button was not available when it should be.

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TreeTop 6.1.2774.0 (December 9th, 2022)

This release is a bug fix release.

Trees

The order of pasted sibling branches could be different from the copied (or cut) branches. This occurred if the order was changed (using the move branch up/down buttons on the tree document ribbon).

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TreeTop 6.1.2770.0 (October 10th, 2022)

This release of TreeTop includes an improved tree layout algorithm in addition to a number of maintenance changes and fixes.

.Net Version

TreeTop, DTrio and Owl are now built against .Net 4.8 (was 4.6 before); v4.6 is no longer supported by Microsoft and will no longer receive security updates. If you are using operating systems older than Windows 10, you may need to manually install the .Net framework 4.8 (or newer).

Authenticode Signing and Strong Naming

All assemblies (the various dll/exe files that make our applications) are now "strongly named". This adds tamper-protection to the binaries, thus eliminating the possibility of someone taking our code, decompiling it, adding malicious code to it, recompiling it and distributing it.
All dll/exe files as well as the installers are also Authenticode signed in addition to strongly named. This verifies the origin of the files and reduces or removes the security warnings that are displayed during installation.

New Application Options

We added new user options for the colors used in the monochrome tornados (Black White / Hi-Lo charts), as well as for the *Default Calculation Mode* (*Automatic* or *Manual Calculation*). The default calculation mode setting only applies to new projects.

Trees

We have been working on changes to the on-screen layout algorithm for quite a while. As these changes impact core functionality, they required significant testing. In this release, the changes are going live. Trees with linked nodes and/or tree links benefit most from these changes.

We have also made some other minor rendering improvements.

Performance Improvements

The drawing of trees utilizing tree links has been massively sped up. In addition, the performance of the layout algorithm for large trees (usually due to tree links) has been improved significantly.

Usability Improvements

When using the "Append" mode to add nodes to a tree, the new nodes can be dropped onto any node, not just the middle node.

We also changed which branch is unlocked for an even number of branches to be "round towards the top". E.g., for two branches, the top probability is now unlocked by default. Due to this change,

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some trees may show a different expand/collapse state from when they were saved with the older versions of TreeTop. Please change expand/collapse and re-save. The old expand/collapse state is not upgradeable under some circumstances. This is a one-time issue only applicable to the visual state of the tree, not to any of the underlying calculations.

Based on user feedback, the hover tooltips for nodes are hidden by default. These tooltips allow pre-viewing of node results for pure combinations of view- and decision-metric. To change whether tooltips are shown, go to *Options → Tree → Show Tooltip*.

Bug Fixes

The rendering did not update when a linked tree was expanded and the tree link node was changed to a different node type (e.g., uncertainty).

Dis-allowed node-linking of Tree Link nodes that pointed to different trees. This should not be allowed, because this is a dependency (correlation) in the tree.

There could be a very rare crash when using tree links due to a bad look-up of joint probability intermediate results.

The Tree Link expander was missing from screen captures.

Expand / collapse of sub-trees and tree links made more intuitive based on user feedback. We also heavily optimized this operation for large trees.

The VOI subtree builder omitted setting reward cells for single cell targets on the no info/no go branch when creating VOI trees that were using model cells for uncertainties/decisions and results.

Tornados and Tornado Comparisons

We added a new ribbon button to display base inputs on the Tornado/Tornado Comparison side-legend. For consistency, the *Show Inputs* is relabeled to *Min/Max Inputs*.

Sensitivities

There were very rare crashes due to layout issues on very high-resolution displays.

The error checking for sensitivities was slightly too aggressive and could cause a crash.

Additional Bug Fixes

When a project is opened whilst another is already opened (i.e., unload project TreeTop file A to open TreeTop file B), the cell picker code could crash.

Whilst opening TreeTop, users could cause a crash by overloading the keyboard handling code by accidentally pressing and holding control keys (Ctrl / Alt / Shift etc.).

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TreeTop 6.0.2709.0 (January 17th, 2022)

This release of TreeTop adds two new document types (sensitivities and manual tornados), as well as new features and improvements for all other document types. We have also added export functionality throughout the application.

.Net Version

TreeTop – as well as DTrio and OWL – are built on .Net 4.6 in this release. If you are using operating systems older than Windows 10, you may need to manually install the .Net framework 4.6 (or newer).

Excel files on Microsoft OneDrive/Microsoft SharePoint

We added a feature to TreeTop to fully support linking to Excel files that are stored on OneDrive/SharePoint directories. This makes the previous work-around to move files to a local directory on the computer unnecessary.

Application Shell

We have improved the ribbon backstage ("the File menu") by adding icons, introducing a new *Home* tab and updating the *New* and *Open* tabs. In addition, we have also made usability improvements to the project navigator, to make it easier to re-order project entries by greatly increasing the mouse-sensitive portion of each project item. We have also optimized various document ribbons in this release to ensure better sizing.

Bug Fixes

TreeTop could crash during start-up if specific keys were pressed during the initialization sequence of the window.

Metrics

We have added the option to specify an offset and added user choices for division by zero handling for simple ratio metrics. This now allows metrics such as "PI = (NPV / Capex) **+ 1**".

Data Export

We have added a number of export functions to TreeTop and consolidated old and new export functions in a section on the *Home* ribbon. Our new generic export implementation supports Microsoft Excel-ML in addition to comma separated values. The Windows clipboard supports multiple data formats simultaneously. This means that the application in which you paste data will choose the data format that is best suited. If you prefer comma separated value over Microsoft

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Excel-ML in Excel, for example, you can choose “Paste Special” in Excel to choose comma separated values.

Excel-ML files have the “xml” file extension. Unfortunately, this is a shared file extension and a very common data format (Extensible Markup Language) also uses this extension. On many computers this results in xml files to be opened in the default internet browser. If this happens, open Excel and choose File -> Open to view and edit Excel-ML files generated by TreeTop.

TreeTop now supports export from Tornados, Tornado comparisons, range of value curves and sensitivities.

The range of value curve export features that were available previously still exist but have been migrated to the new data export buttons on the *Home* ribbon. We have augmented the old CSV export with Microsoft-ML export for the range of value curve data.

Tornados

The Tornado editor has been rewritten to a large extent; the remaining pieces have been updated.

- The scrollbar design now works much better and allows scrolling to see only variables in scenarios where the Tornado has many variables.
- The editing of dependency information between variables has been changed to be more obvious to use, even for users that are not used to dealing with dependencies between variables.
- The view switch (Detailed vs. Compact) has been retired as part of these changes.
- The flow of the editor has been changed slightly to accommodate more information to be displayed in the same screen real-estate for many use cases.
- The input fields for most on-screen components have been made wider to make it easier to read Excel references.
- Variable order can now be changed via drag-drop.

Manual Drop Lines

Users can now add manual drop lines to tornados. These can, for example, be used to identify the value of specific deterministic scenarios on tornado charts.

The drop lines editor is available from the *Document* ribbon.

Macro Execution Order

The macro execution order was changed slightly and now mirrors the macro execution order of the tree that is generated using the Tornado to Tree wizard.

The changes should not change any results generated by projects using macros in Tornados previous to this change. However, the before/after calculation macros are now called for every bar, not once per Tornado.

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This change enables the use of macros to generate Tornados from third party calculation engines, using Excel as an intermediary. In particular, those clients that are currently working on TreeTop / PetroVR integration via Excel are now able to generate Tornados (and thus Tornado comparisons) from PetroVR projects.

Tornado to Tree Wizard

The wizard dialog has been updated overall. Some of the highlights include:

- Variable re-ordering is now supported via drag-drop.
- The sorting of variables by variance of a metric is more clearly indicated.
- Error/Calculation messages are displayed in the table in addition to prompts.
- Dependency information is shown only when the underlying Tornado contains dependencies.
- Additional fly-over help has been added for novice users.
- Edited the end-user instructions.
- A size information / confirmation was added when creating large trees with the wizard (729 or more end nodes for Excel; 81 or more end nodes for Enersight).

Performance

When creating a tree from a Tornado, results that have been calculated are inserted into the tree directly without recalculation.

Manual Tornados

TreeTop now natively supports manual entry Tornados. Manual entry tornados are a separate document type accessible from the *Home* ribbon. The *Add Tornado* button adds a calculated tornado by default (Excel or Enersight). Manual Tornados are available as a drop-down option from that button.

Manual Tornados are first class documents, including support for Tornado to tree workflows and Tornado comparisons.

Tornado Charts

We have improved the automated font scaling that takes place when many bars are added to a single Tornado to ensure that values remain readable for a much larger number of bars.

Tornado Comparisons

Editor

We have updated the Tornado comparison editor and moved it into a side-bar. In addition to now supporting drag-drop and a cleaner user interface, this allows collapsing of the side-bar to hide the editor once all required tornados have been added to the comparison.

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Legend

We added new legend options to the Tornado comparison. The legend highlights which Tornado bars on the comparison originate from. The legend changes its appearance automatically to support the various views that a comparison can be changed to.

Tornado Comparison Charts

We have improved the automated font scaling that takes place when many bars are added to a single Tornado comparison to ensure that values remain readable for a much larger number of bars.

Trees

Value of Information and Delta Display settings for Decision Nodes

Decision nodes have a new Delta / VOI settings section under the node properties. If switched on, a value of information or delta value is displayed next to each branch of the decision node. The delta/voi value is calculated as the difference to a user-specified base branch of the decision node.

Contextual Tree Links

We have changed the tree link implementation to take (Excel-)context into account. Whereas previously a linked tree always had the same results, regardless of link-origin, the origin is now unfolded to calculate the tree in that specific context (i.e., taking any substitutions that happen “to the left” into account).

This change has a number of important ramifications:

- In rare circumstances, older files that utilize tree links may generate different results! If this is undesirable, you can make appropriate substitutions at the root of the tree that is linked to, to correct this.
- Trees can grow unexpectedly large very quickly. Every tree that is linked to now exists multiple times in memory.
- This feature can be used to model many very complex problems very easily.

We will make a white paper with details and walk throughs available shortly after release.

Value of Information Wizard

Trees that have been created using the VOI wizard can now be edited to change the probabilities. This works as long as the VOI subtree has not been changed.

Bayesian Revision

The Bayesian revision now executes immediately (without showing a confirmation dialog) if there is only a single revision candidate. If multiple options to revise with exist in the tree, the dialog is shown to allow the user to select the correct node to revise with.

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Bug Fixes

It could be hard to edit the column width of the right-most tree level in multiple metrics view, when horizontal metric layout was selected. The mouse-over area was partially obscured by metric name labels.

Range of Value Curves

User Data Points

Data points can now be added to each series. This can, for example, be used to mark specific deterministic scenarios that have been calculated but are not present in the underlying tree. Another use is to manually show lines for internal hurdles etc.

Performance

We have re-written parts of the charting engine to dramatically increase performance for large projects (many thousand end nodes). A test project with ca. 50.000 end nodes now renders in approx. 2 seconds, where it could take up to two minutes to fully generated the chart previously.

New Highlight styles

The charting performance improvements allowed us to implement additional options to highlight data points. In addition to the *flash* that has been available previously, there are now *beacon* and *chevron* animations.

We have also improved the image export from charts to always correctly show highlighted data points.

Sensitivities

We have added sensitivities to TreeTop as a new document type. Sensitivities can be run against any node in a tree. In this release, one- and two-way sensitivities to value are supported. Note that sensitivities to probability can be achieved by linking probabilities to Excel cells in a workbook. We will draft a white paper shortly after release that explains how to run sensitivities, including many examples shortly after release.

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TreeTop 5.0.1896.0 (September 18th, 2019)

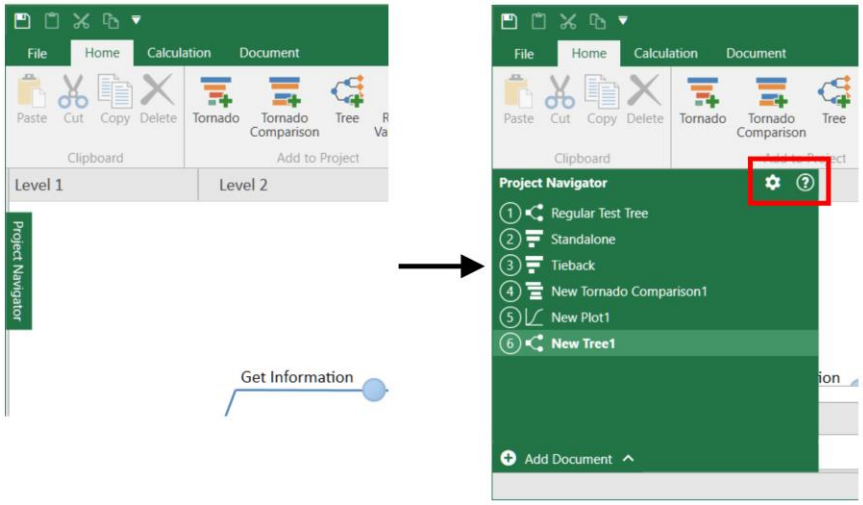
This is a feature release with a focus on overall usability and specific improvements for Value of Information trees.

Application Shell

Project Navigator

The document tab design, which was loosely based on the Microsoft Excel user interface has created a lot of user feedback in the past. In particular, TreeTop projects often contain more documents than can be displayed on the tab control. Reviewing the feature requests that have been submitted for the tab interface led us to the conclusion that the tab interface could not realistically be amended to fulfill all requests. We thus took a step back and decided to re-design the document navigation within TreeTop completely.

The new *Project Navigator* opens a document panel similar to DTrio when clicked. Note that settings and help are available in the top-right of the *Project Navigator* panel.



Document Ribbon Tab

We have replaced the various document specific ribbon tabs with a single, context sensitive, *Document* ribbon tab. If this ribbon tab is active, it tracks the currently selected document changing buttons etc. accordingly. This greatly reduces the number of mouse clicks required in the application.

Better High DPI support

As high dpi displays are more common now, we've made a variety of changes to support high dpi environments, such as 4k displays better. The most noticeable change is a completely new icon set for the application. Other minor improvements can be found throughout the applications – some are only noticeable in high dpi environments.

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Other changes

We have slightly changed the application start-up sequence to avoid having an obscured “New Project” window that may be hiding behind other applications.

The Excel initialization sequence has been tightened in a variety of ways to be more fault tolerant when third party Excel add-ins are causing problems in Excel automation mode.

A new Enersight command is now supported in TreeTop Enterprise (Scenario – Escalations).

Various performance improvements.

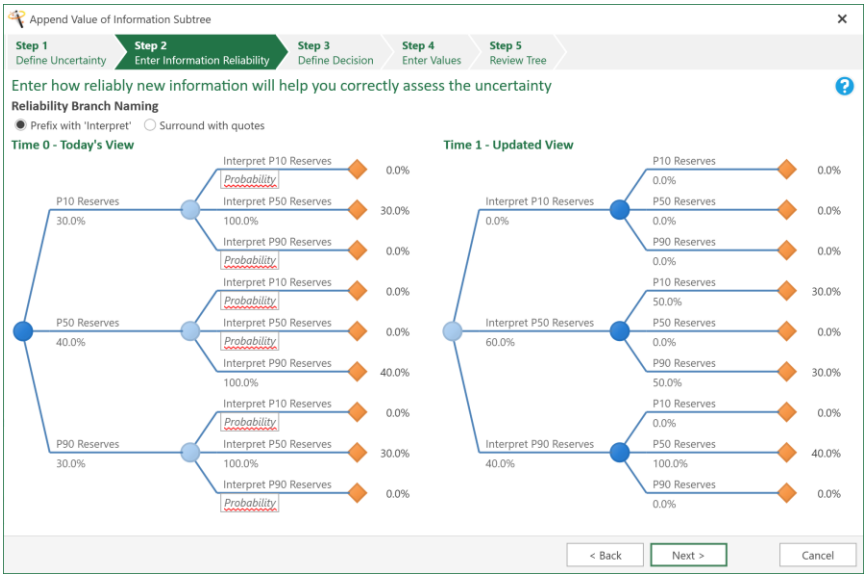
Under some circumstances, many of the on-screen elements of TreeTop were displayed in bold font. This has been identified and fixed.

Trees

New Value of Information Wizard

The Bayesian Subtree Wizard has been replaced with a new *Value of Information Subtree Wizard*. The wizard is available from the *Document* ribbon. The interface is loosely modeled on the DTrio XL wizard, but offers many features that are specific to TreeTop, such as the ability to tie to an Excel workbook for calculations and the ability to handle up to five branches for uncertainties.

The wizard can be used multiple times within the same tree. This allows the end user to easily add complex VOI scenarios (such as multiple VOIs in a row) to any project.



Game Theory / Multiple Metrics Display

We added an option to avoid repeated rendering of the metric names in the tree for end nodes when horizontal display is used. The metric names now always show in the level headers bar and can be switched off within the tree.

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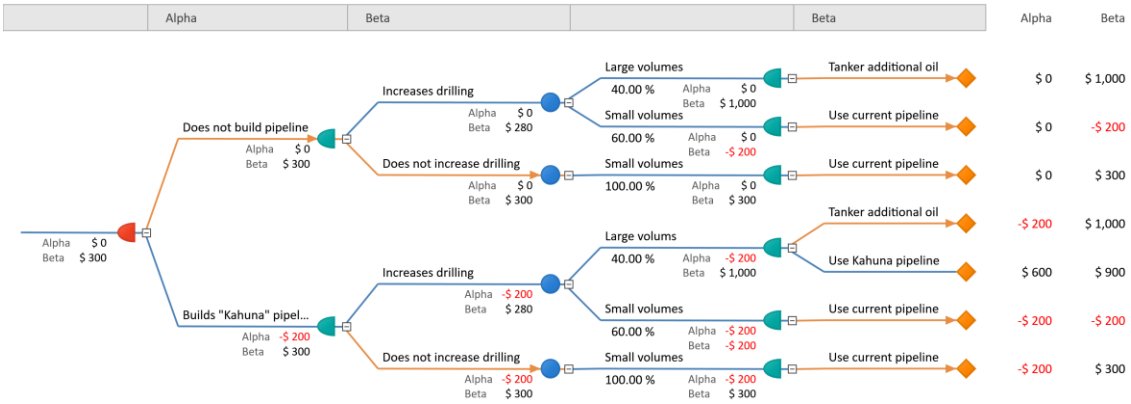
In particular, for game trees, which are often quite compact, this can lead to significantly cleaner views.



Bug Fixes & Improvements

The right-click context menu did not show icons correctly on some systems.

Adding/inserting nodes via right-click context menu could lead to an infinite loop if the parent nodes were linked to each other.

In rare circumstances, the various in-place editors could stay on screen when they should have gone away. Sometimes this led to an application crash.

In-place editors now react to changes in level width immediately, if they currently have focus.

Tornados

There was a rare crash in the Tornado column mapping wizard if the user provided invalid references consisting of multiple areas in the workbook.

Tornado Comparisons

The report view has been improved – the report chart layout was changed slightly to match the chart view better in terms of dimensions and has been augmented with the metric that is displayed. In addition, the report view now updates immediately if the chart is changed, without having to go to the chart to make formatting changes.

There have been a number of minor visual adjustments and improvements.

Range of Value Curves

We added a new feature, accessible via the ribbon to copy legend data to the system clipboard for pasting into various target applications, such as spreadsheet programs.

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The ribbon commands now work when viewing the report tab – the chart is immediately refreshed, removing the need to go to the chart tab to edit the chart appearance and then going back to the report.

Various other small improvements.

Bug Fixes

The data table export could crash if the destination file was in use by another application.

When creating a Range of Value curve from a tree, the initially displayed metric is always set to be the same metric that is currently shown in the tree. Sometimes the metrics drop-down in the bottom right did not correctly reflect the metric that was currently displayed until the chart was refreshed once after creation.

Corporate Licensing and Telemetry

This release features application support for corporate licensing. In scripted environments (application deployed by IT) it is now possible to inject a corporate user license as part of the installation. This removes the need to obtain a license code from Decision Frameworks for application end-users. This feature requires registry keys to be added as part of the scripted installation – please contact us for more details.

In addition to corporate licensing, we have also added application telemetry. Application telemetry allows us to gauge feature usage to aid direct our software development efforts. In addition, in corporate licensing environments, application telemetry is used to verify total user counts.

Known Problems

Under Windows 7/8, a small number of icons/glyphs may not be drawn correctly and replaced with a small rectangle. This depends on the update status of the installed system fonts.

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TreeTop 5.0.1713.0

This is a maintenance release with a few new features. The focus of this release was on improvements of our calculation engines. We have also fixed all reported bugs.

Calculation Engine Changes – Excel and Enersight

Nodes that contain error values (#REF, #NA, etc. from Excel; error messages from Enersight) are recalculated when *Calculate* is clicked in the ribbon. This avoids having to clear a tree to get rid of unwanted calculation engine specific runtime errors and throwing away good results.

In addition, we have also added a right-click option to clear specific nodes / subtrees. Again, this avoids having to recalculate an entire tree to update a few nodes.

When working with Excel models, please note that none of these changes apply to *Automatic* calculation mode. **Users must enter *Manual* calculation mode** to enable recalculation of runtime error results and to be able to manually reset partial trees. This restriction does not apply to Enersight based projects, as *Automatic* mode is not available.

Logging

TreeTop always had application logging built in, but it was by design hidden from end users. We have revisited this design decision and made changes to the logging framework and exposed the settings. End users are now easily able to configure application logging.

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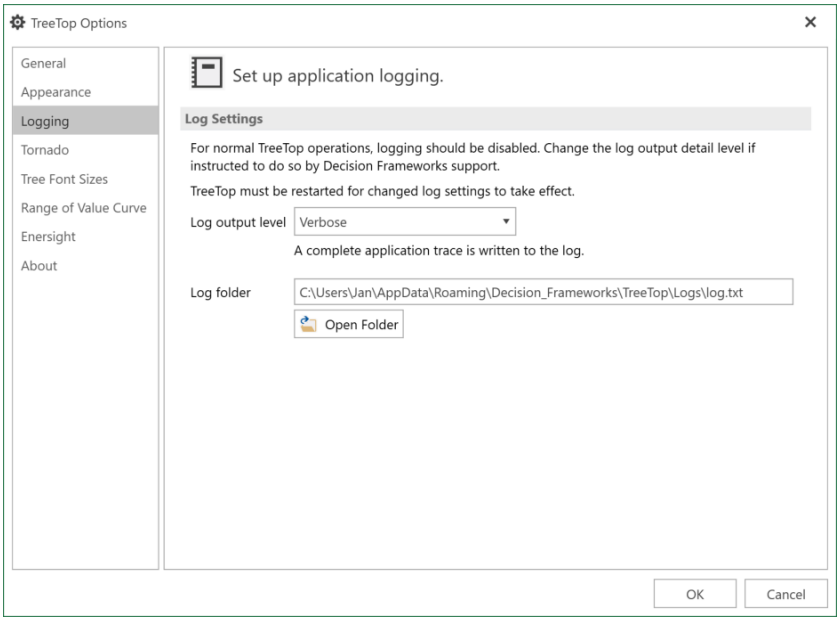
Please note that turning application logging on at any level may have a **severe performance impact** on TreeTop. We strongly suggest to only switch logging on when requested to do so by Decision Frameworks support.

Changes to application logging settings require an application restart to take effect.



Enersight Link – TreeTop Enterprise

This version introduces a rewritten link to Enersight to improve stability, resilience and recovery in various scenarios.

To enable users to customize the behavior depending on the complexity of the Enersight models, we have exposed a few settings via end user options. These are accessible from *Options -> Enersight*.

The maximum batch size determines how many scenarios are queued in Enersight in parallel. A higher value may lead to better performance; however, in the case of failure, more results may be impacted.

The client-side timeout determines a time after which TreeTop will terminate the current batch. Note that this is a delta-timeout, not a total batch time. I.e., the timer is reset as soon as progress is reported by Enersight.

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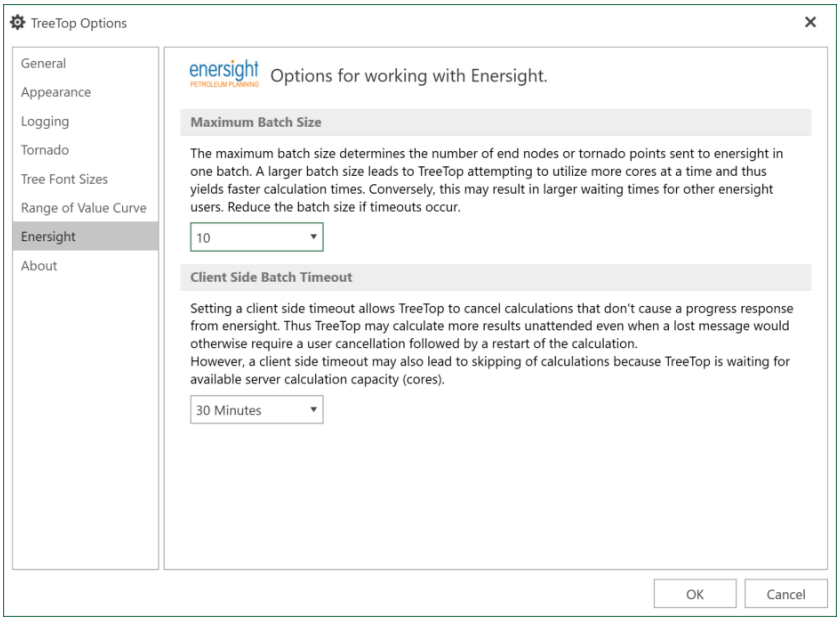

Enersight Commands – TreeTop Enterprise

We have added a number of new commands that are available to match the Enersight risk scripting command set.

Other Minor Changes and Bug Fixes

We have slightly improved the display of error messages in trees, in particular for end nodes. That makes errors generated by the calculation engine much more visible and easier to read.

The Bayesian Subtree Wizard could crash under some conditions when it was invoked in places of a tree where it could not operate, in particular in the middle of trees with linked nodes. The button to invoke the wizard is now disabled in scenarios where it doesn't make sense to invoke it and it would thus be unable to operate correctly.

Very rarely, Excel references could "vanish" from the Tornado "Cell to Vary" setting. This has been fixed.

In Enersight based Tornados, changes to the setup/teardown commands did not result in cleared results, forcing the user to clear and calculate. This has been fixed.

In addition, a number of smaller bugs have been fixed.

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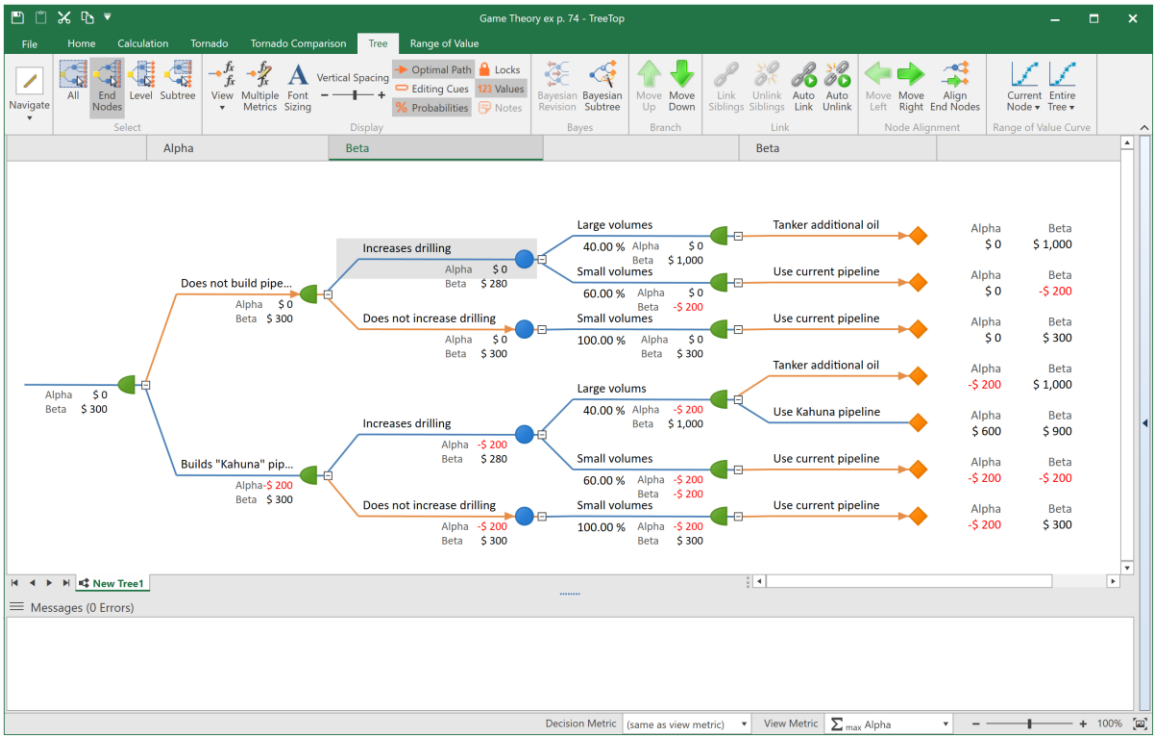
TreeTop 5.0.1662.0 (TreeTop 2018)

The various 4.0 releases of TreeTop were Enterprise releases, in which new features were piloted. TreeTop 5.0 brings the advancements of the Enterprise releases to the Professional version of TreeTop. From version TreeTop 5.0, the Enterprise and Professional versions of TreeTop are a single code base distributed via a single installer. Enterprise features are enabled with specific activation codes.

TreeTop 2018 features a new application shell to take advantage of the new Microsoft user interface guidelines.



In addition, TreeTop 2018 brings a host of improvements for various charting features. All charts support customizable font scaling. Tornado Comparisons have new display modes and Range of Value curves support highlighting of specific points, in addition to filtering.

We have also added a new metric type – Simple Ratio metrics allow the calculation of typical profitability indicators (such as PI, PIR, VIR, CER, DPI) without using an external Excel calculation. Simple ratio calculations in TreeTop are very performant, resulting in an overall performance increase of around 40% for typical models that have a separately defined simple ratio metric.

Lastly, we have re-worked our entire graphics stack for better performance on laptops without dedicated graphics cards and swapped out third party libraries that caused problems for a few users.

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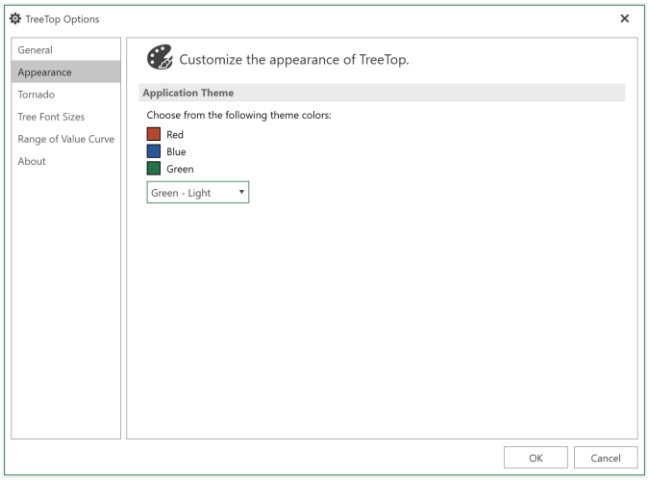
New Application Shell

TreeTop 2018 features a completely new application shell. This application shell offers typical features seen in the latest Office applications, such as the new ribbon and application backstage pages.

Users can access the license information from within the application now and change the license (for example, to upgrade from a Professional to an Enterprise license). Changing license is available from the *File* menu.

The new application shell supports theming similar to the theming support in DTrio and OWL. Theming is available from the application options (*File → Options → Appearance*).



We have also changed all fonts throughout the application for better readability.

The progress screens have been changed for TreeTop 2018 to report more details on the calculation. This aids in particular with longer running calculations.

Simple Ratio Metrics

TreeTop 2018 introduces a new metric type. In addition to Roll-back and Excel calculated metrics, we've added *Simple Ratio* metrics. This new metric type aims to replace Excel calculated metrics for various capital efficiency metrics used by most, if not all, of our users. Performing the division in TreeTop rather than using Excel for the simple division offers significant performance benefits. In our testing, typical case study example calculation times improved by around 40%.

They work – similar to Excel calculated metrics – by making the appropriate division at every node in the tree, rather than rolling back the results of a division.

We encourage all users to switch simple ratio-based metrics, such as PI, PIR, VIR, CER, DPI to this new metric type, rather than continuing to use Excel spreadsheets for these metrics.

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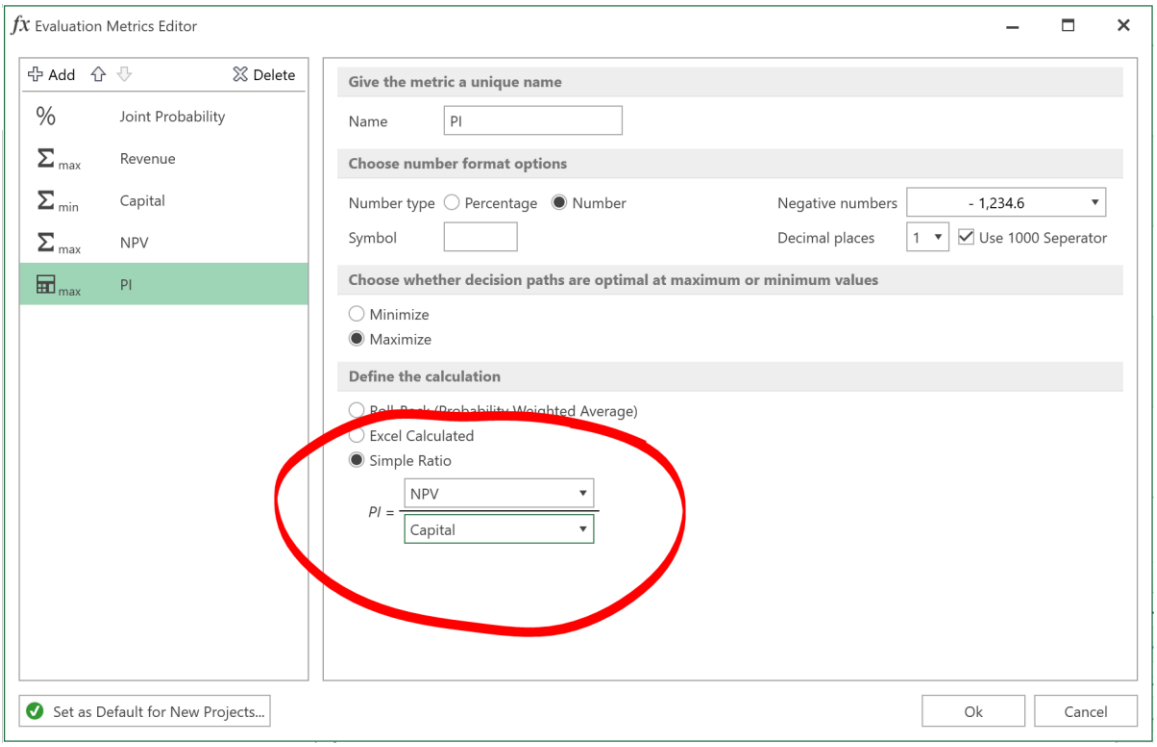

Trees

Trees have a slightly updated look in TreeTop 2018. In addition to adopting the new look, we have also made usability improvements in a number of places, leveraging our drag/drop reordering technologies. For example, substitutions in the Nodes Properties window are now reordered via drag drop.

Tornados

Tornado charts have been improved significantly in TreeTop 2018. In addition to a new, cleaner look and better display of the various numeric data, we have added font scaling to Tornado charts.

The new default look of bars is a *Flat* look. Users that preferred the *Beveled* look of TreeTop 4.0 and earlier can switch to that display in the ribbon.

The algorithm used to choose the display of significant digits of inputs has been improved. “Floating bars”, resulting from step changes in the model, have been addressed in a different manner from previous versions of TreeTop. All available data points are now displayed – a tornado bar that was displayed as a floating bar in the past is now drawn in a lighter shade in the part connecting it with the base line.

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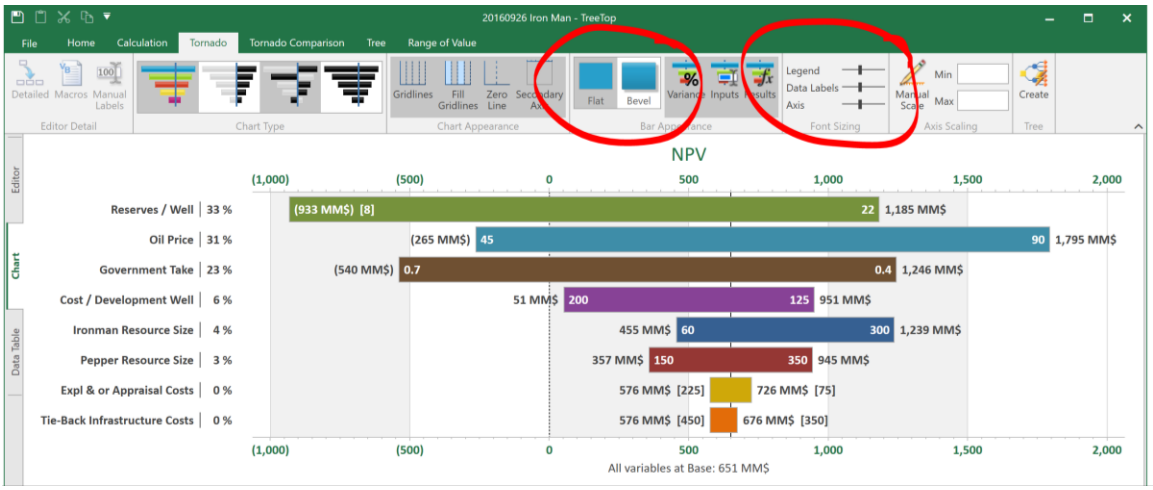
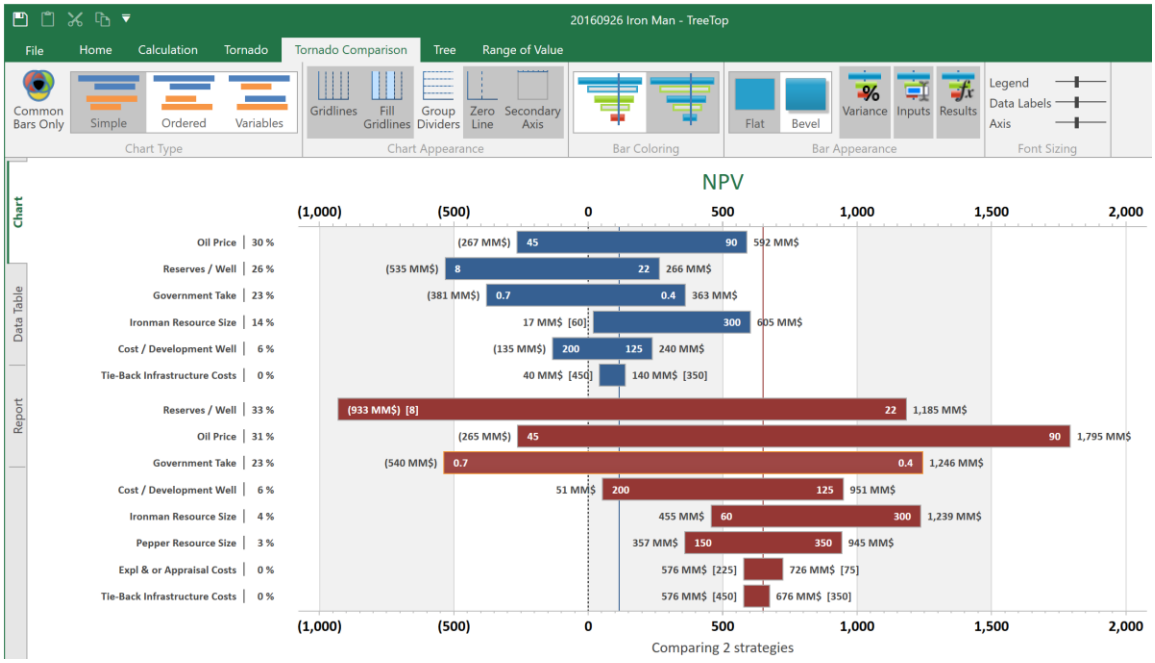


The Tornado Editor and Data Table have seen slight improvements in the usability as part of the transition to our new TreeTop 2018 look and feel.

Tornado Comparisons

In addition to changes made to the Tornado engine above, Tornado Comparisons have gained a wide variety of display options.



By combining the new *Chart Types* with *Bar Coloring* settings, users can achieve many different looks, potentially illuminating various comparative features of the chosen Tornados. We encourage users to habitually look at the different *Chart Types* and *Bar Coloring* modes when comparing Tornados to gain more insights.

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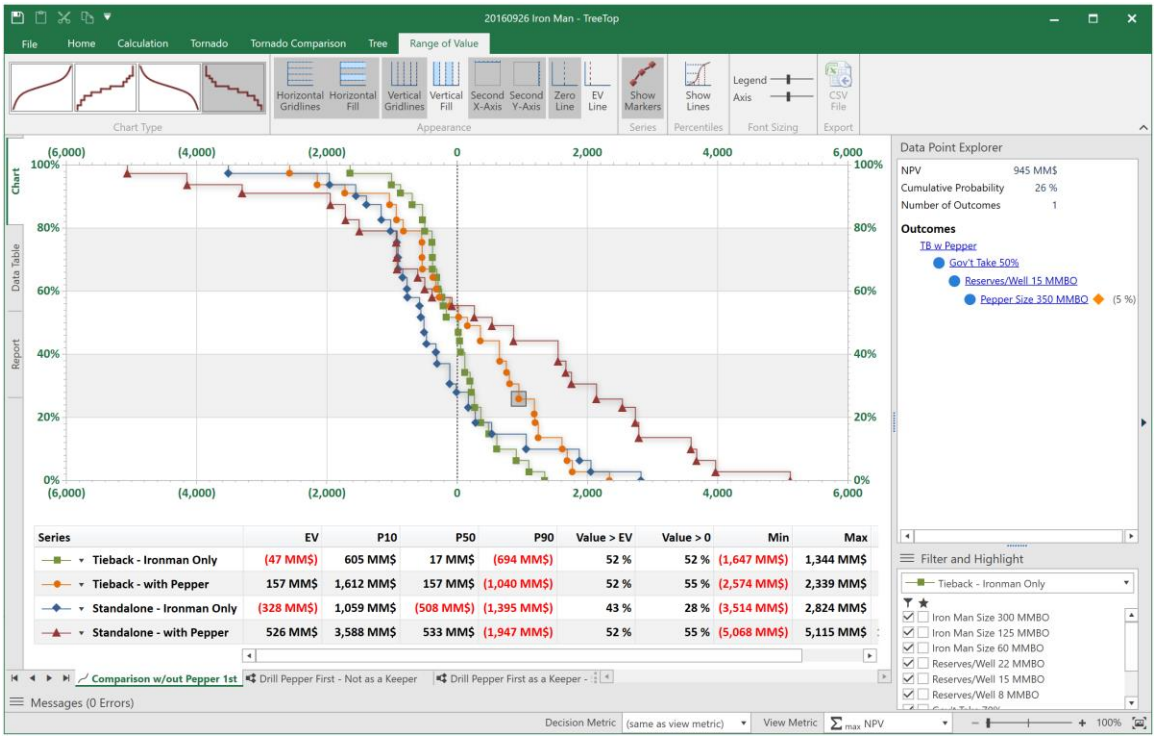
The comparison view of TreeTop 2014 is still available. It is the *Variables* comparison of the *Chart Type* selection.

Range of Value Curves

In addition to cleaner looking charts and font sizing, we have added highlighting to range of value curves. This allows users to very quickly see which points carry certain components, such as "highlight all points with a P10 Oil Price component". This feature has been added to the filtering panel in the bottom right of the screen. Note that multiple selection results in an "or" combination of components.



We have also redesigned the various end-user customizations for the chart appearance into a single drop-down menu for each series. The available customizations are still the same, however the redesigned UI access for these features removed the requirement for a switch between an editable legend and display legend.

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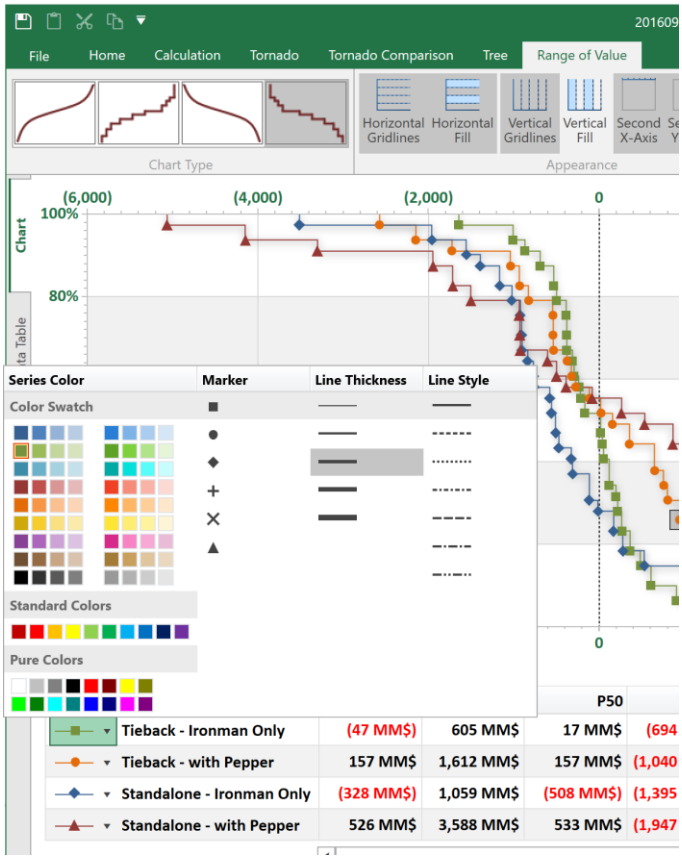

Bug fixes

All client reported bugs and automated crash reports have been addressed.

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TreeTop 3.0.1152.0 (TreeTop 2014)

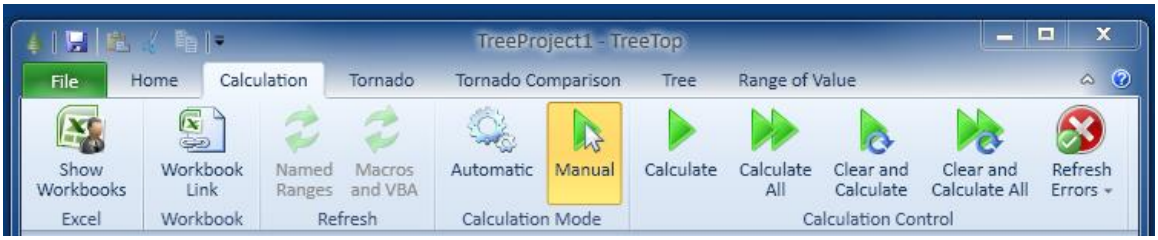
This feature release marks the release of TreeTop 2014.

Manual Calculation Mode

We introduce manual calculation mode to offer a high degree of control over TreeTop for large projects, or projects with slow calculation engines. Automatic calculation mode is still available, and is the default calculation setting for new projects. Manual calculation mode also takes advantage of the smart recalculation features of the TreeTop calculation engine to only calculate those parts of the project that have been invalidated by changes.

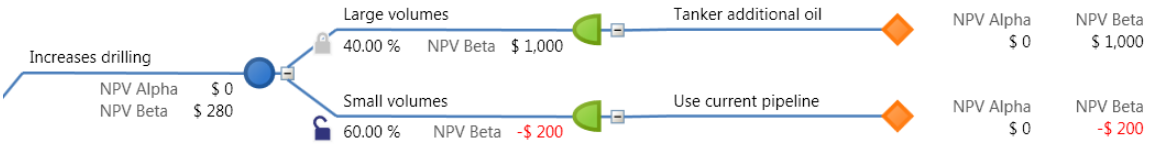
The former *Excel* ribbon tab has been renamed to *Calculation* and has received additional buttons to expose the new functionality.

In addition, calculation related buttons from the *Home* ribbon tab have been migrated to the *Calculation* ribbon tab to keep buttons with similar functions together.



Multiple Metrics View Mode

TreeTop's unique calculation engine allows independent switching between decision metrics and view metrics. Coupled with the capabilities of logic nodes, this has always made TreeTop a strong tool for evaluating both traditional decision tree problems, as well as game theory problems. However, especially for game theory applications of TreeTop, the display of multiple metrics at the same time was a core request. We have implemented this request along minor work on logic nodes to make TreeTop a first choice tool for game theory.



In addition to game theory applications, the multiple metric view mode has already proven its usefulness in traditional tree scenarios during closed beta testing.

Multiple metric view mode is selected from the *View* drop-down, located in the *Display* group of the *Tree* ribbon tab (1). Choosing *Edit Multiple Metrics* (2) allows customization in a dialog (3). Note that only messages prompting the user to customize are displayed in the tree when Multiple Metric

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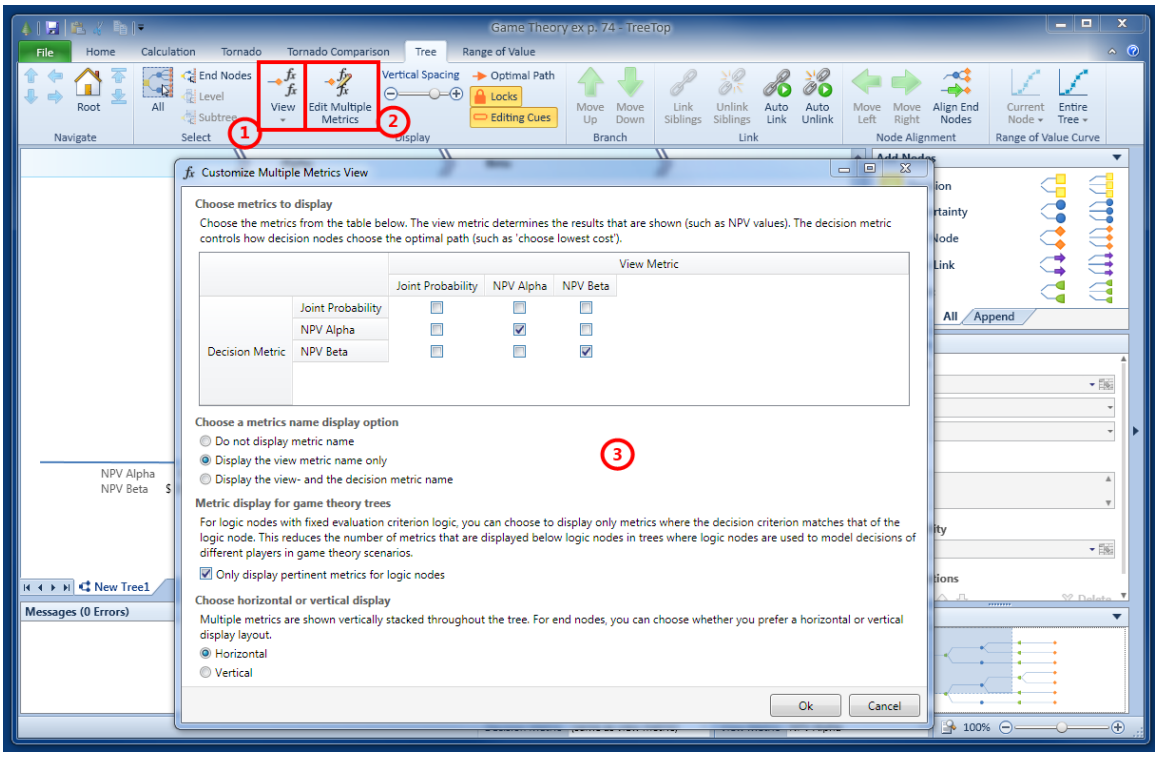
mode is selected until the user has customized the mode using the dialog. Multiple Metric display customization is per-tree, i.e., needs to be done separately for each tree in a TreeTop project.



We will publish white papers soon after the release of TreeTop 2014 to introduce game theory applications for TreeTop to those users that have had only little exposure to this specific class of problems in the past.

In addition, we are working on a white paper that shows applications of multiple metrics view modes in traditional tree evaluations.

Please check our website from time to time for the availability of these white papers.

More Control Over Tree Display

We have added the ability to hide some of the decorative and lesser used user interaction elements in the tree until the mouse hovers over them, or completely. This allows users to clean up the display in editing view mode, for example, or to remove optimal path visual hints for discussion of a strategy tree.

The buttons for this functionality are located on the *Tree* ribbon tab in the *Display* group.

Additionally, we have also increased the maximum vertical spacing, to allow those view modes which use a lot of vertical screen real estate, such as auditing mode and multiple metrics, to expand further vertically.

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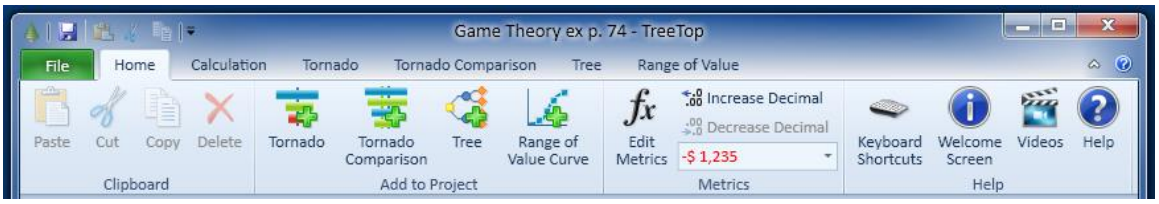
Help Videos and Welcome Screen

We have produced a variety of help videos in the past months, which are available from our web site. In order to make users aware of these, we have added a *Welcome* dialog which makes users aware of these, as well as this release notes document.

Whether the welcome screen is displayed at every start or not can be controlled from within the dialog (*Show at startup* checkbox). The dialog can also be accessed from the *Help* group of the *Home* ribbon tab.



The videos can be accessed directly from the same group.

Complete List of Changes

New Features

1. Introduced manual calculation mode with ribbon control buttons under *Calculation* ribbon tab.
2. Introduced multiple metrics view mode
    a. Also added a dialog to allow user customization of some aspects of the display of this mode.
3. Tree branch labels that are linked to cells are now retrieved even when Excel calculation is paused.

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4. Tornado variable names and low/base/high labels are now retrieved even when Excel calculation is paused.
5. The Tornado Auto Fill wizard now retrieves values for the Excel mapping screen even when Excel calculations are paused.
6. Improved rendering of error icons on tree for better performance and better image quality when zooming.
7. Increased maximum vertical spacing in trees (user definable). This allows for more space with view modes that display multiple lines of information below the node branches.
8. Added user controllable tree display settings that can be applied in most view modes. This enables the user to hide visual cues which are not required for the current task.
    a. highlight optimal path
    b. display probability lock
    c. display reward entry cue
9. Changed the display of indented nodes ('skip level') to left-align text on the node branch and take advantage of the additional horizontal display space.
10. End nodes are now decorated with a calculation icon to augment the text message ("Calculate" or "Paused"). This denotes that calculation is required because either manual calculation mode is selected, or because automatic mode is selected and calculations have been paused.
11. Added billboard to make user aware of Range of Value curve requiring calculation if all curves need calculation.
12. Added calculation prompts to Range of Value curve legend to make user aware of a subset of curves on a chart requiring calculation (used to show "Error" before).
13. Added a new Welcome Screen to make users aware of the new help videos that we have produced, as well as this document.
14. Made Help Videos available via a ribbon button for quick access to the web page.

Breaking Changes

1. Changed macro execution code to skip call to Excel Calculate before macro execution. It is now the macro's responsibility to calculate the workbook prior to execution, if this is required.

Note: This may require the addition of an Excel Calculate call to some macros to function in the same manner as previous releases of TreeTop. Most macros are however not impacted by this change, as many actions that are typically performed by macros automatically cause a calculation call. In any case, a call to Excel Calculate is only required if the macro requires intermediate results from the spreadsheet.

Other Changes

2. Much improved automatic assignment of probabilities to uncertainty branches.

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3. Upgraded third party crash reporting component to latest version (same as DTrio NG) – this allows optional collection of email address from user submitting crash reports to follow up when reproduction of crash fails.
4. Ribbon Changes to consolidate calculation functionality
    a. Renamed “Excel” ribbon tab to “Calculation”.
    b. Introduced new “Calculation Control” group within ribbon tab.
    c. Moved “Pause” button to “Calculation Control”.
5. The range of value curve now recalculates Excel calculated metrics (such as VIR, PIR, PI, …) on the fly for Range of Value curve expected values. This yields a result that corresponds to building the equivalent tree, making the EV more accurate in some cases.
    - *Note:* This does not impact the actual curve that is generated.
6. Additional changes to accommodate Excel multi-threading issues. A change in the multi-threading (parallel computation) of Excel causes incorrect call termination notices to be generated by Excel; subsequent calls to Excel may fail, if Excel reported that a previous task was finished, when in fact it was still being processed. TreeTop now recognizes when this happens and re-tries after a short wait to allow the previous task to finish.
7. Change: Changed the order of the logic editor to display “Default” first, followed by branch logic to encourage a user to pick a default branch first and thus eliminate duplicated effort (entering logic for a branch that is subsequently picked as a default branch and thus executed no logic).
8. Improved heuristics for tree calculation progress.

Bug Fixes

1. Bug fix: When inserting tab items in a project, the TreeTop project file was irrecoverably corrupted under some circumstances.
2. Bug fix: TreeTop installer did not always remove previous versions from Windows Add/Remove programs dialog (old versions where in fact removed from disk; just the program entry remained).
3. “Tornado Autofill Wizard” and “Tree from Tornado Wizard” now open on the same monitor as the main application on multi-monitor setups
4. Bug fix: Under rare conditions it was possible that TreeTop crashed due to a race condition in the Excel substitution engine.
5. Bug fix: Range of Value curve did not use selected marker style for curves (always defaulted to square). This was introduced in release 2.2.845.0 as part of the performance work for switching metrics on range of value curves.
6. Bug fix: Range of Value curve legend could show positive probabilities in red under some circumstances.
7. Bug fix: Fixed a threading issue in the Range of Value curve that could lead to a crash under rare circumstances.
8. Bug fix: Under rare circumstances, TreeTop would stop updating the vertical spacing between nodes when changed by the user until the tab was re-activated.

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9. Bug fix: In certain tree-node combinations that combined nodes that used look-ahead for calculation of joint probability, inserting a node via mouse-right click could cause a crash.
10. Bug fix: On Tornado Comparisons, the mini-Tornados “Base” labelling number format was sometimes incorrect.
11. Bug fix: Removing a metric that was used as a part of the definition of a logic node in the tree could lead to a crash.

Additional minor bugs fixed and performance tuning changes.

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TreeTop 2.2.892.0

Release 2.2.892.0 is a minor change release which offers small features and additional bug fixes which were reported after the release of v2.2.845.0.

1. Added support for local named ranges in Excel models
2. All charts now contain a metric caption for the in-built screen capture (Tornado, Tornado Comparison, Range of Value Curves)
    a. Additionally Tornados and Tornado Comparisons have x-axis captions outlining the value of all variables at P50 and number of Tornados compared respectively.
3. Removed “Auto Tree” text that was pre-pended to tree names when trees are generated from Tornados. This was a remnant from a previous version of TreeTop where tabs did not have type icons and could only be distinguished by name.
4. Bug fix: Deleting a component of an XL calculated metric whilst viewing a Tornado causes TreeTop to crash on some machines
5. Bug fix: Invalid file path supplied during save of TTP file causes TreeTop to crash
6. Bug fix: Tornado editor small visual bug fixes

Additional minor bugs fixed.

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TreeTop 2.2.845.0

Release 2.2.845.0 is a bug fix release for TreeTop 2013.

1. Fixed crash when opening a TreeTop project after extensive changes to the underlying workbook were performed offline, such as moving worksheets between linked workbooks.
2. Fixed crash when using Range Mapping Wizard from within Tornado whilst Excel Interaction was paused.
3. Bug fix: Network drives were sometimes not correctly recognized leading to TreeTop refusing to open Excel workbooks that were stored on network drives.
4. Bug fix: De-serializing Tornado caused cached data to be invalidated forcing a re-calculation of Tornado results when opening a previously fully calculated project.
5. Numerous bug fixes and improvements for international (non-US English) regional settings of Windows.
6. Performance improvements for scenarios where Range of Value curves had thousands of markers for some metrics but only dozens of markers for other metrics.
7. Bug fix: TreeTop entered an infinite loop when a metric had zero variability across all results for a Range of Value curve.
8. Added code to recover corrupted TreeTop files. This works for minor corruptions, such as a “bit flip” due to a faulty hard drive sector.
9. Recognize a mixed mode Office installation (e.g., Office 2010 with Lync 2013) and display a corresponding error message. TreeTop does not start until this PC configuration error has been resolved. A corresponding help topic was added to the online help and is reachable via the error message.
10. Numerous changes to accommodate Excel multi-threading issues. A change in the multi-threading (parallel computation) of Excel causes incorrect call termination notices to be generated by Excel; subsequent calls to Excel may fail, if Excel reported that a previous task was finished, when in fact it was still being processed. TreeTop now recognizes when this happens and re-tries after a short wait to allow the previous task to finish.

Additional minor bugs fixed and performance improvements.

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Contact Information

If you have any questions or experience any problems, please contact support@decisionframeworks.com or call +1 713-647-9736 during normal business hours which are 9:00 a.m. – 5:00 p.m. CST.

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