
The Standard for Data Visualization and Analysis



Version 11 New Features



SentinelVisualizer.com

New Features in Version 11

Sentinel Visualizer Version 11 makes it faster and easier to import, analyze, visualize, search, and manage large datasets. Major enhancements include powerful new data import capabilities, faster Visualizer performance and navigation, expanded search options, and significant database performance improvements.

Version 11 Enhancements Summary

- Improvements when running version 11 for the first time on your database.
- Performance Improvements.
- Import Enhancements.
 - Select only the source columns you need and arrange their order.
 - Create calculated columns using formulas and values from multiple columns, eliminating the need to modify your source data.
 - Import Excel named ranges and tables, in addition to worksheets and cell ranges.
 - Use a Unique ID to identify relationships and improve duplicate detection.
 - Import SQL Server tables from schemas other than dbo.
 - Detect more data errors before and during imports with improved validation.
- Visualizer Enhancements.
 - Use separate data refinement for filtering and restricting new items.
 - Entity names are replaced by custom labels in output lists and Excel exports.
 - New layouts only reposition visible entities, leaving filtered (invisible) ones unchanged.
 - New keyboard shortcuts quickly change layouts, zoom, stretch, and compress diagrams.
 - Get Links -> Between Selected can hide unlinked entities and apply a new layout to the results.
 - Merge multiple saved Visualizer diagrams and list their entities and relationships.
 - Online maps use OpenStreetMap or Azure Maps.
- Entity Search Enhancements.
 - Simple Entity search adds Exact, Starts With and Contains, plus multiple name search.
 - Improved and reorganized Advanced Entity search with four tabs with a grid to find multiple entity names, find multiple metadata values, and Last Changed range.
- Search results with more columns including each entity's relationship counts.
- Entity View and Edit Enhancements
- Documents
 - Search text in PDF files.
 - Add or delete multiple documents at one time.
 - Entity and Relationship Documents added to View menu.
- Exports
 - Exports to Excel with support for international characters and regional date formats.
 - Control whether Reader users have Timeline and Geospatial features in diagrams.
- New Command Line options for automated imports and restoring checkpoints.

Startup and Initial Use

Initial Startup

The first time version 11 runs:

- If the product key was provided in the setup program, the program is automatically activated if there's an internet connection.
- While the sample database is being created the first time, a progress meter shows the steps and opens the database once it is created.
- If Group Policy prevents writing to the shared Public Documents folder, the My Documents folder is used.
- When a database is opened for the first time, the Most Recently Used (MRU) list that appears on the home page is pre-populated with entities that have the most relationships.

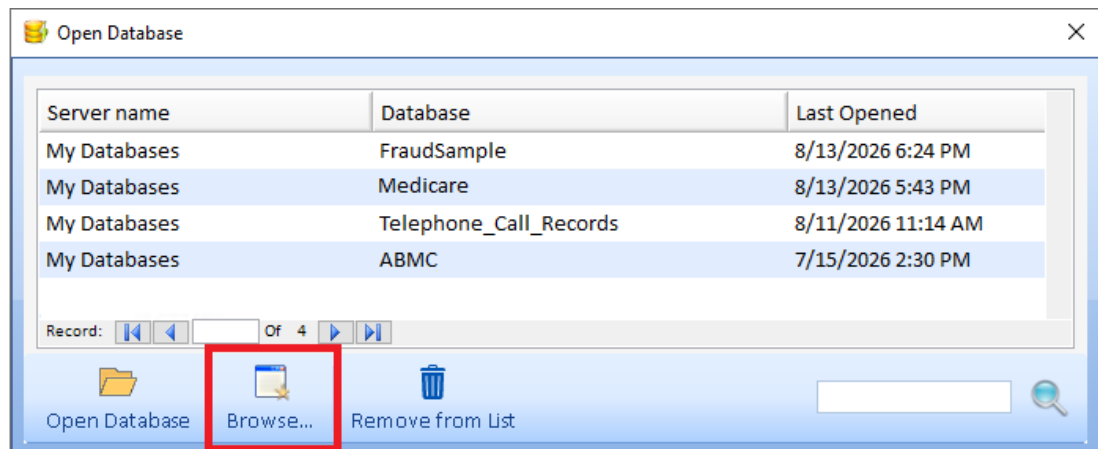
Database Updates

The first time an existing database is opened with Version 11, the database is backed up and upgraded while retaining its previous settings.

- DateTime columns are updated to higher precision DateTime2.
- Binary columns are updated.
- Additional database indexes improve search and query performance.
- Updated metaphone storage.
- Cached values for database, entity, and relationship counts.

Open Database

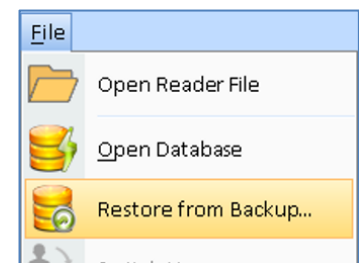
[Browse...] button replaced [Add to List].



Open Database Dialog

Restore Database from Backup

Version 11 can restore a database directly from a backup file. When no database is open, select File > **Restore from Backup** to restore the database to your local SQL Server without using SQL Server Management Studio (SSMS).



Performance Improvements

Version 11 improves performance throughout Sentinel Visualizer, with particularly noticeable benefits on large databases and complex Visualizer diagrams:

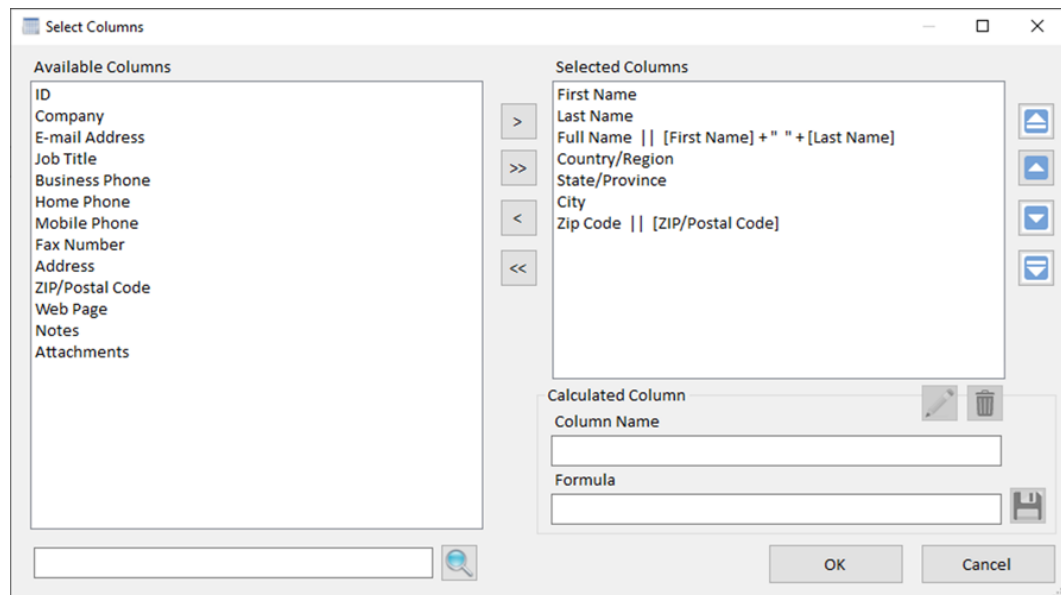
- Quicker loading of databases, especially previously opened databases, including search lists showing counts by lookup value.
- Visualizer offers faster incremental layouts, network metric calculations, dataset filtering, and online map loading.
- Optimized entity thumbnails reduce image-processing overhead and improve performance.
- Optimized searches for linked entities and relationships by type.
- Faster entity name and metaphone searches.
- Faster searches for entity and relationship counts of documents, metadata, and notes.
- Quicker saving of entity and relationship edits.

Import Enhancements

Import Columns

Select Just the Columns You Need

The new Select Columns feature lets you choose just the columns to import and their order. This simplifies the Import form by displaying only the source columns you need.



Add Calculated Columns

Calculated columns let you transform and combine source data without modifying the original data. Create formulas that reference source columns and other calculated columns. A calculated-column's formula can:

- Reference column names.
- Reference other calculated columns.
- Support any expression and function the source data allows.
- Be referenced later in the WHERE clause.

Create a Calculated Column by Referencing Columns and Using Formulas

Excel Import Enhancements

Import Named Ranges and Tables in Excel Spreadsheets

When an Excel spreadsheet is selected for import, you can choose from its worksheets, named ranges, and tables. You can still specify an explicit cell range, but selecting a named range or table eliminates the need to define one manually. This is especially helpful when importing files generated by systems that export data as predefined Excel tables or named ranges.

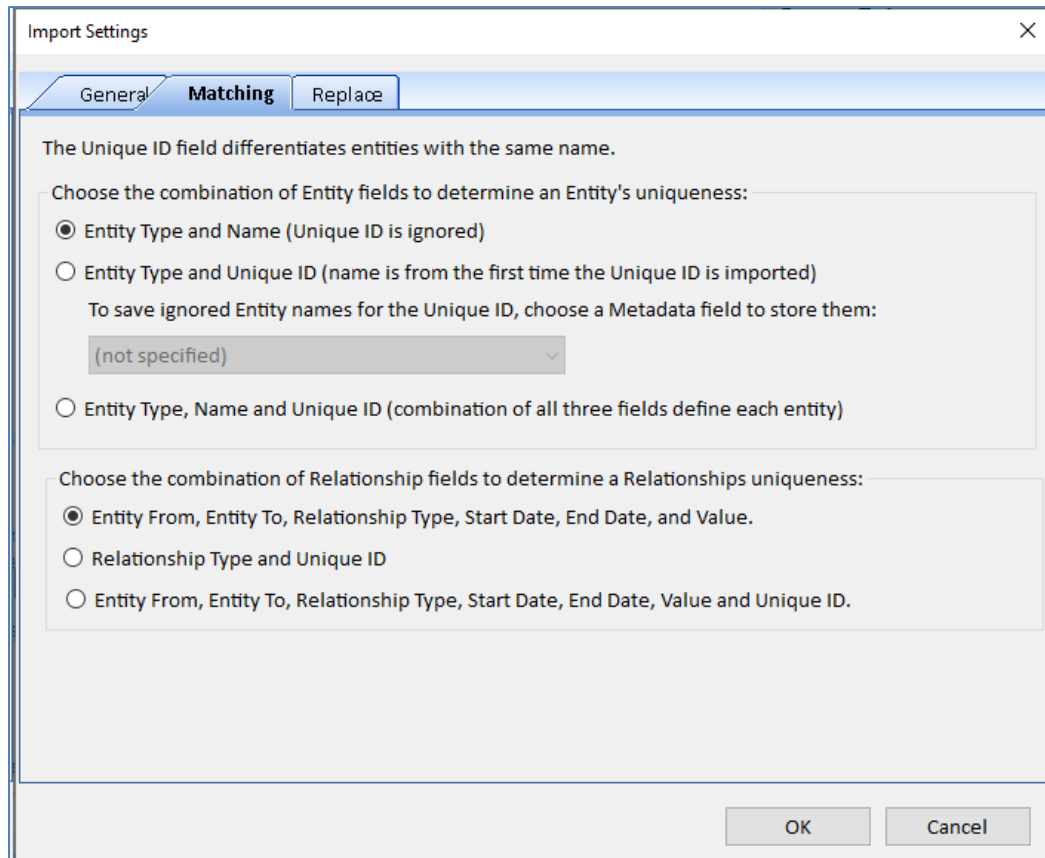
Sheet dropdown includes worksheet names, named ranges, and tables

When import settings are saved, the named range or table automatically adjusts to its current location and size the next time the spreadsheet is imported.

Define Relationships with a Unique ID

When importing relationships, Sentinel Visualizer needs to determine whether it is new or already exists. Version 11 adds support for a Unique ID column and provides three ways to define whether a relationship is unique:

- Entity From, Entity To, Relationship Type, Start Date, End Date, and Value.
- Relationship Type and Unique ID
- Entity From, Entity To, Relationship Type, Start Date, End Date, Value and Unique ID.



Import Settings

General **Matching** Replace

The Unique ID field differentiates entities with the same name.

Choose the combination of Entity fields to determine an Entity's uniqueness:

- ☒ Entity Type and Name (Unique ID is ignored)
- ☐ Entity Type and Unique ID (name is from the first time the Unique ID is imported)

To save ignored Entity names for the Unique ID, choose a Metadata field to store them:

(not specified) ▾
- ☐ Entity Type, Name and Unique ID (combination of all three fields define each entity)

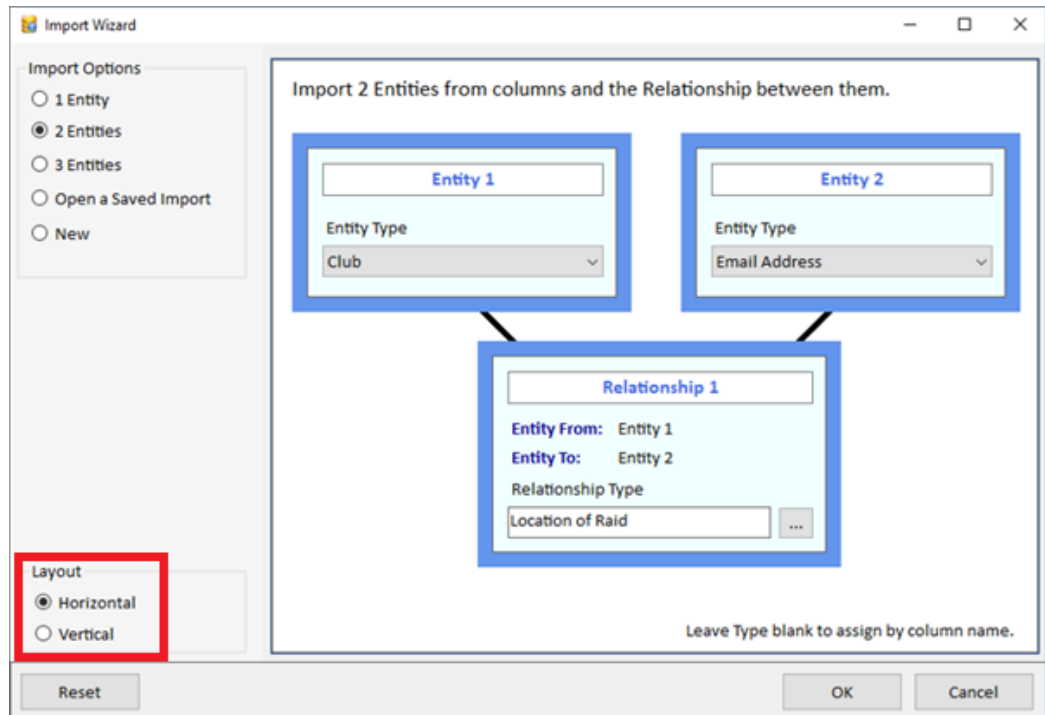
Choose the combination of Relationship fields to determine a Relationships uniqueness:

- ☒ Entity From, Entity To, Relationship Type, Start Date, End Date, and Value.
- ☐ Relationship Type and Unique ID
- ☐ Entity From, Entity To, Relationship Type, Start Date, End Date, Value and Unique ID.

OK Cancel

Import Wizard Layout Option

New option to display your entity and relationship boxes horizontally or vertically.



Import Wizard

Import Options

- ☐ 1 Entity
- ☒ 2 Entities
- ☐ 3 Entities
- ☐ Open a Saved Import
- ☐ New

Layout

- ☒ Horizontal
- ☐ Vertical

Reset OK Cancel

Import 2 Entities from columns and the Relationship between them.

Entity 1

Entity Type

Club ▾

Entity 2

Entity Type

Email Address ▾

Relationship 1

Entity From: Entity 1

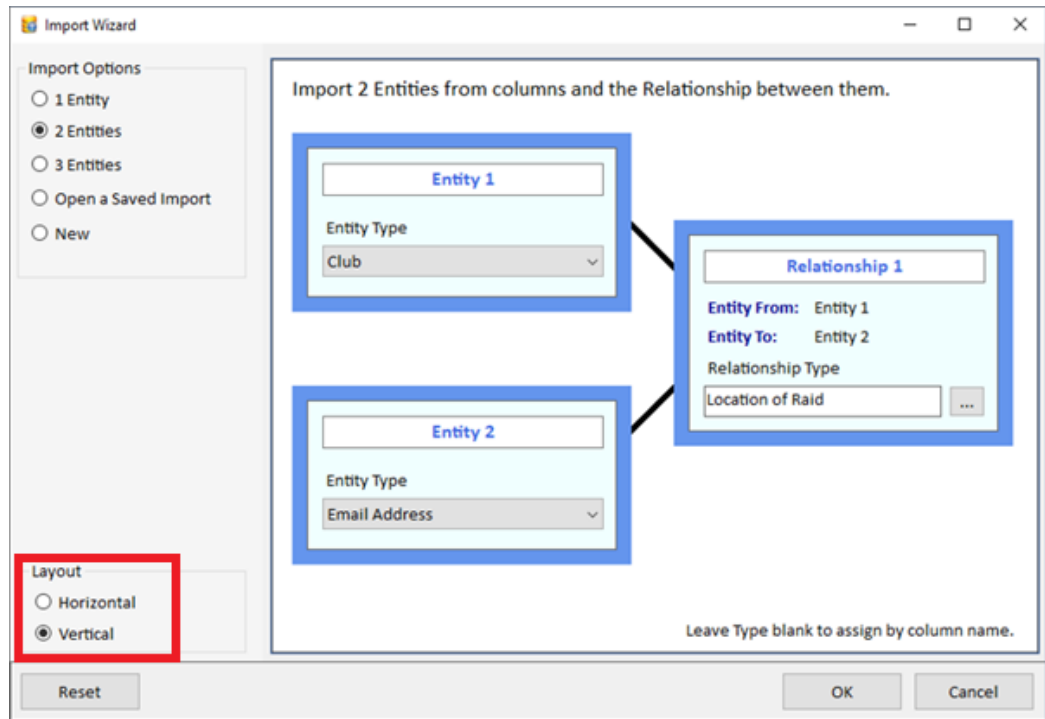
Entity To: Entity 2

Relationship Type

Location of Raid ...

Leave Type blank to assign by column name.

Horizontal Option for Entity Boxes



Vertical Option for Entity Boxes

Improved Validation Before and During Data Import

Data Preview

- Blank rows are excluded.
- Relative image paths resolve correctly.
- Date columns show their time portion.
- Brief field text is shown.

Validate the Entire Data Source Before Importing

Before importing begins, Sentinel Visualizer validates the entire source and reports up to 100 errors at once, letting you correct multiple problems in a single pass. For large datasets, the validation process can be canceled.

Previously, only the first 500 rows were validated and processing stopped at the first error. Errors later in the source could therefore cause the full import to fail.

Other Import Enhancements

Add Topic to Existing Entities and Relationships

Topics are used to tag related entities and relationships. They are also used with Advanced Security Features to control the data users can see. All imported new entities and relationships are assigned the specified topic.

If an import encounters an existing entity or relationship, it isn't added again. However, if the specified Topic isn't already assigned to it, version 11 adds the Topic. This lets an import assign additional Topics to existing data, rather than assigning the Topic only to newly created entities and relationships.

Improved Date Parsing

You can specify a custom date format, such as YYYYMMDD. If the value cannot be converted using that format, your Windows date format is applied. If neither format produces a valid date, the error is logged.

Import Form Enhancements

- WHERE clause is kept when source data changes.
- Multiple rows in a box can be deleted by pressing the delete key.
- Improved placement of the Import and Query Builder user interface boxes.
- When saving the import specifications, the SVIX's folder location is remembered.

Additional Enhancements

- Improved handling of source data that is locked, unavailable, or corrupt.
- Import of text files converted to UTF-8 format for improved support of international data.
- Text files with periods in their name or in READONLY folders can be imported.
- SQL Server tables in addition to the dbo schema can be selected for import.
- Improved performance with only the selected columns retrieved.

Visualizer Enhancements

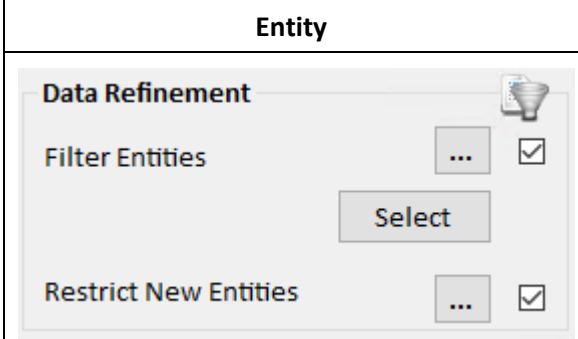
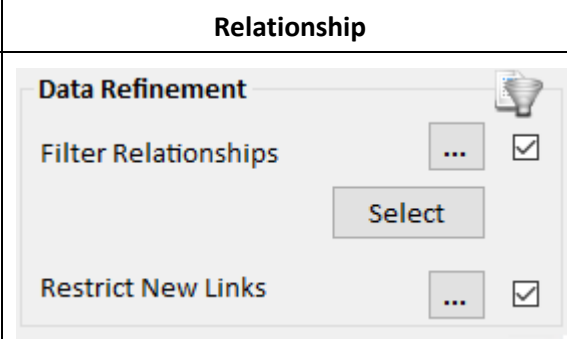
Version 11 makes Visualizer diagrams faster and easier to navigate, rearrange, filter, and analyze.

Separate Data Refinement for Filter and New Items

Data Refinement lets you use the dataset builder to filter and select entities and relationships on your diagram and limit the new items added with Get Links.

Previously, the same criteria were used for both. Version 11 lets you define separate criteria for filtering/selecting items on the diagram versus limiting new items added with Get Links.

For instance, you may want to add only linked phones rather than all linked entities. Each Data Refinement section has a [...] button for specifying the criteria and a checkbox to enable it.

Entity	Relationship
	

Custom Label Replaces Entity Name in Output

By default, the entity label is its name. You can customize the label individually or create it from the entity's Type, Status, Start and End dates, Metadata, metrics, and other values. The custom label now appears in the output Lists and Excel output instead of the original name.

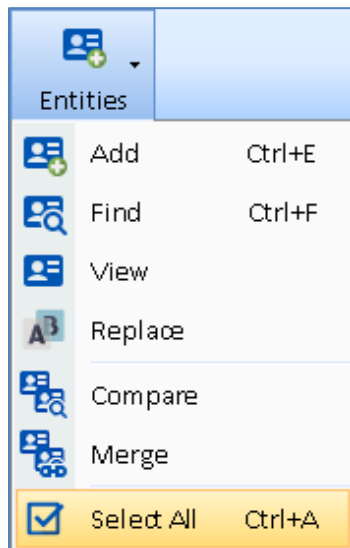
New Layout Only on Visible Entities

If there are hidden (invisible) entities on the diagram, choosing a new Layout only rearranges the visible entities to optimal locations. Previously, the hidden entities were also moved.

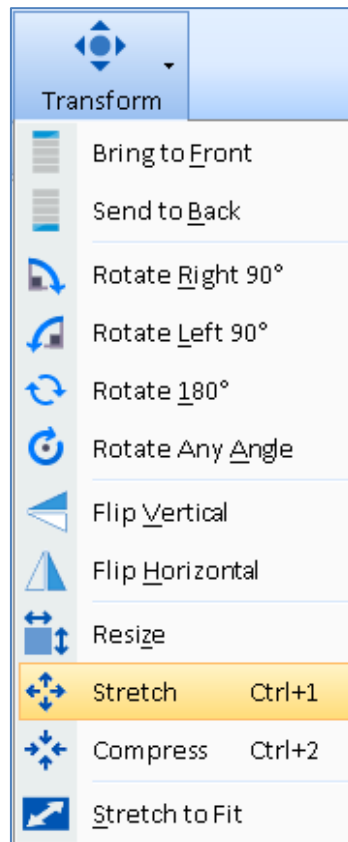
Quickly Modify the Diagram

Select all Entities; Zoom, Stretch and Compress Your Diagram

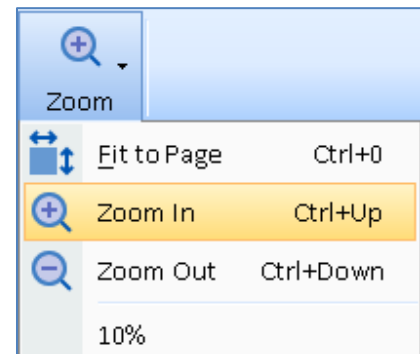
Simplify and quickly view your diagram in different ways with a single click:



Select all Entities with Ctrl+A



Stretch and Compress with Ctrl+1 and Ctrl+2



Fit to Page with Ctrl+0,
Zoom in and Out with Ctrl+Up and
Ctrl+Down

Stretch/Compress versus Zoom

Stretch and Compress change the spacing between entities without changing the size of entity images or label text. Zoom changes the scale of the entire diagram.

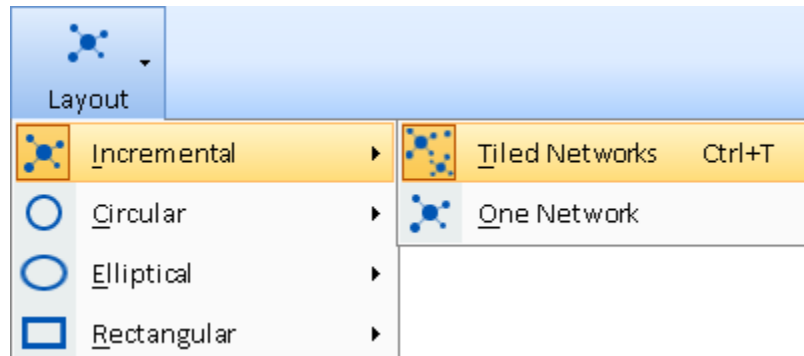
Stretch is useful when long entity names need more room, while Compress brings widely spaced entities closer together.

Zoom In and Out

The Zoom In and Out menu items let you adjust the zoom level of your diagram. Rather than specifying a specific zoom level, use Ctrl+Up to Zoom In and Ctrl+Down to Zoom Out. Zoom with Ctrl plus mouse scroll wheel up and down remains.

Run a New Tiled Network Layout

Easily rearrange the location of your entities and relationships with Ctrl+T. Selecting this multiple times can quickly show different layouts that may improve your network visually.



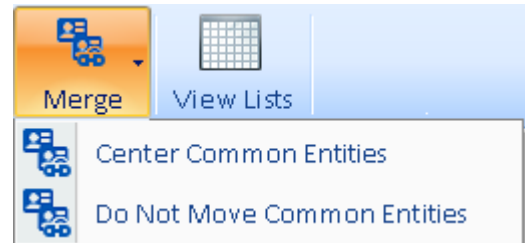
Apply a New Tiled Network Layout with Ctrl+T

Use Undo (Ctrl+Z) to go back to the previous layout.

Merge and List Multiple Diagrams

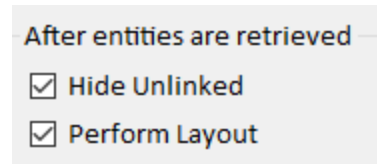
From "Open Saved Visualizer" on the Home page or Visualizer menu, select multiple saved diagrams and use Merge to combine them into one.

The new "View Lists" button shows the entities and relationships in the selected diagrams.



Get Links, Between Selected Options

Get Links -> Between Selected retrieves entities and relationships to connect the selected entities. After the entities are retrieved, Version 11 can hide unlinked entities and automatically rearrange the remaining entities for a more visually appealing layout.



Online Maps with OpenStreetMap and Azure Maps

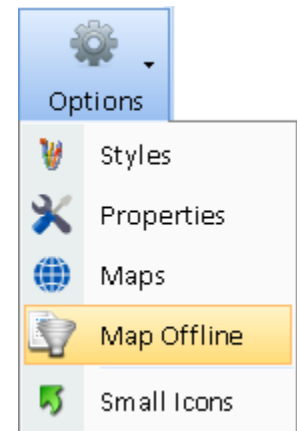
The online maps now use OpenStreetMap and Azure Maps instead of Bing maps.

Offline Maps

Offline Maps are optional. To use an offline map, select Map Offline under Options.

Additional Visualizer Enhancements

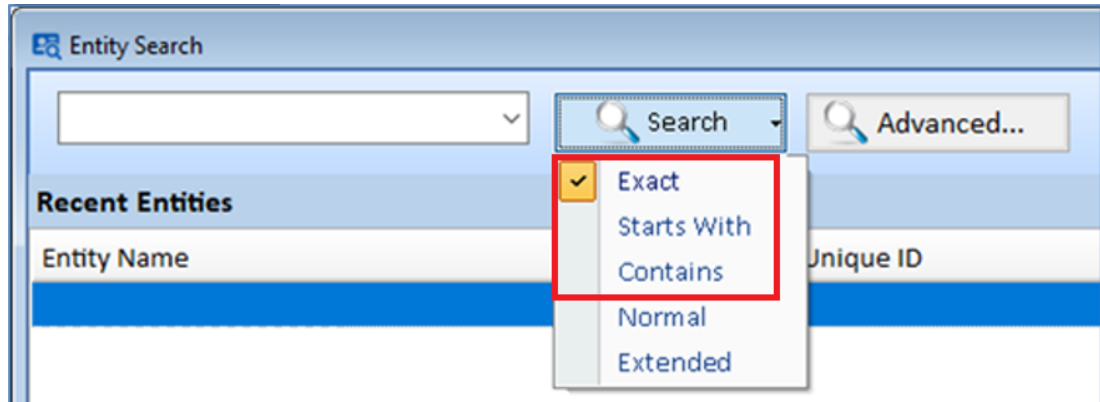
- Opening the Visualizer loads more quickly without flashing.
- If the labels on Relationship lines are customized with counts, sums, start/end dates, and/or metadata, when the Timeline is filtered, the labels are adjusted to the filtered relationships.



Search Enhancements

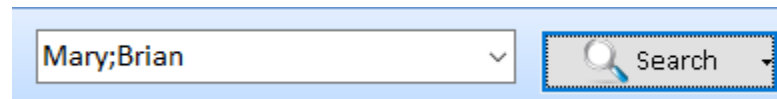
New Simple Entity Search Options

Three new search options: Exact, Starts With, Contains.



Search Multiple Values

Find multiple values by separating with semicolons.



Search for Entity Names Mary or Brian

Improved Unicode and Numeric Searches

Improved Unicode searches, so international words in any script (Chinese, Arabic, etc.) match correctly. Large numeric ranges are also handled more precisely.

Improved and Reorganized Advanced Entity Search

Advanced Entity Search is redesigned to make complex searches easier to build. Search criteria are organized into four tabs, with new options for multiple names, metadata values, lookup lists, and date ranges.

- Search for a list of entity names in a grid.
- Metadata type search for multiple values.
- If a Metadata type has lookup values defined, a new selection form is available.
- Find most recently modified entities.

Name and Type Tab

The Name and Type tab supports multiple entity names that can be copied and pasted from another source like a spreadsheet. Options let you search for Exact, Starts With or Contains.

Name and Type Tab

General Tab

General Tab has many values, ranges, distance, and count searches:

Filter	>=	<=
Start date	(not specified)	10/20/1974 12:00:00 AM
End date	(not specified)	12/29/1992 10:33:12 AM
Latitude	(not specified)	-90
Longitude	(not specified)	-122
Value	(not specified)	79
Weight	(not specified)	1

Count	>=	<=
Links	0	83
Relationship	0	88
Metadata	0	46
Document	0	21
Note	0	5
Topic	0	2

General Tab

Entity ID and Unique ID support finding multiple values separated by semicolons.

Unique ID supports using the percent character % for wildcard searches like starts with ABC (ABC%), contains ABC (%ABC%), and ends with ABC (%ABC).

Metadata/Lookup Tab

Search Metadata and Lookup Values for Classification, Dissemination, Entity Status and Topics. Multiple metadata values are separated by semicolons including wildcard searches.

Metadata Type	Entity Type	Value	Condition
Country	University	US; Canada	AND
Gender	Person	Male	
(not specified)			

Classification (1,265)	Dissemination (1,265)
☒ Confidential (4)	☒ NOCONTRACT (16)
☒ For Official Use Only (3)	☒ PROPIN (1,248)
☒ Secret (16)	☒ UASCO (1)
☒ Top Secret (767)	
☒ Unclassified (475)	

Entity Status (1,265)	Topics (1,265)
☒ Alive (281)	☒ Child Slavery (11)
☒ Deceased (84)	☒ Default (461)
☒ Incarcerated (261)	☒ IED (4)
☒ None (568)	☒ ImportedFromV2 (787)
☒ Unknown (71)	☒ NarcoticsCase (2)

Metadata/Lookup Tab

If the Metadata Type has a lookup list, a new selection form lets you pick one or more of them:

Select One or More Values

- ☒ Country
- ☐ Australia
- ☒ Canada
- ☐ China
- ☐ Ecuador
- ☐ Egypt
- ☐ England
- ☐ Mexico
- ☐ Taiwan
- ☒ US

OK Cancel

Select Multiple Values for a Metadata Type with a Lookup List

Created/Modified Tab

An entity or relationship always has a Created Date, but if it wasn't modified later, the Modified Date is blank. A new Last Changed search finds recently changed records. It uses the Created Date when the Modified Date is blank.

Created/Modified Tab with Last Changed Search

Search by Entity and Relationship Type

Easily select entities and relationships based on their type. Previously, this was available under Dataset Builder.

Search Results

The Search and Query Builder results show lists of entities and relationships with improvements:

- Brief text is shown.
- Time is omitted for date-only values (midnight).
- Entity Latitude and Longitude are shown with greater precision.
- Numeric values are right-aligned for easier comparison.
- Taller rows and word wrapping display more information.
- Data grids consistently use Calibri font.
- Copy rows from any data grid with Ctrl+C and paste them into Excel with column headers.

For entities, additional columns are shown for each entity:

- **Relationships:** Total number of relationships with other entities.
- **Relationships From:** Number of relationships FROM this entity to other entities.
- **Relationships To:** Number of relationships TO this entity from other entities.
- **Lines:** Number of connected entities, regardless of the number of relationships with each entity.

Relationships ▾	Relations From	Relations To	Lines
187	187	0	124
157	157	0	79
54	52	2	33

Entities and relationships now show the number of associated Documents, Metadata, Notes, and Topics:

Documents	Metadata	Notes	Topics ▲
0	12	1	1
2	8	0	1
7	9	4	1

Entity View and Edit

Load Relationships on Demand

When viewing an entity with 1000+ relationships, a prompt confirms loading the Relationship tab since that takes time. A Refresh button is available to load it later.



Entity Type Icons

The built-in entity type icons, defined in the Entity Type lookups, are updated to higher resolution graphics when the database is updated to version 11.

The entity type editor now lets you save the current icon to disk.

Entity Type

Name

Person

Icon





Weight

50

☐ Location

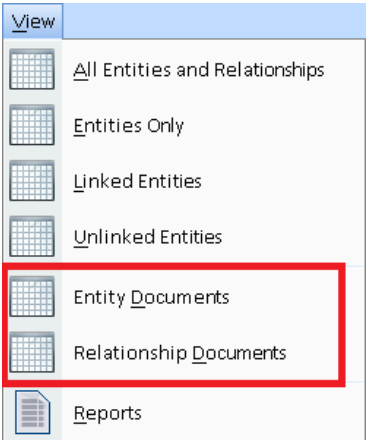
Document Enhancements

Each entity and relationship can have multiple documents assigned to it.

- Sentinel Visualizer now extracts text from attached PDF files so their contents can be searched. When an existing database is upgraded to version 11, searchable text is extracted from previously saved PDF documents so their contents can be searched.
- When editing an entity or relationship, multiple documents can be added or deleted at one time. Previously, they could only be added or deleted individually.
- Document lists use the file-type icon from the associated Windows application, so icons may differ between computers.

Documents Added to View Menu

New Entity Documents and Relationship Documents options on the View menu display all documents associated with entities or relationships, along with the corresponding entity or relationship



Export Enhancements

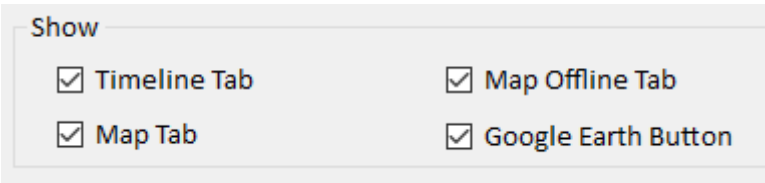
Export to Excel

1. Saves files as .xlsx by default with improved international character support.
2. Exports data to a formatted Excel table with automatically sized columns.
3. Date/time columns use your Windows regional formats.

Export to Reader

Share interactive Visualizer diagrams with people who don't own Sentinel Visualizer by exporting them for the free Sentinel Visualizer Reader.

If your diagram includes timeline and geospatial data, the Reader export includes four new options that control which features are available to Reader users: Timeline tab, Map tab, Map Offline tab, and Google Earth button.



New Export to Reader Options

Other Enhancements

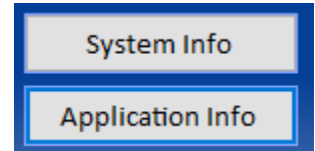
A variety of other enhancements were implemented.

Reports

Improved metadata formatting in Entity and Relationship Reports.

About Box

- New button to launch the Microsoft System Information utility.
- New button to generate an application information log file.



Error Handling

Improved error handling for database creation and verifying SQL Server Express is installed. Error logs are easier to read with more details. Execution logs can be generated for tracing.

New Command Line Options for Automated Imports

The command line lets you run the program without using the user interface. After specifying the database, two new command line options are available for importing data:

- /checkpoint – Restore this checkpoint name to the database.
- /importfile – Specifies the import specification file to run the data import and closes the program upon completion.

Additional Resources

For more details:

- Visit our website <https://SentinelVisualizer.com>
- Get the user manual:
https://sentinelvisualizer.com/LinkAnalysis/user_manual/version11.htm