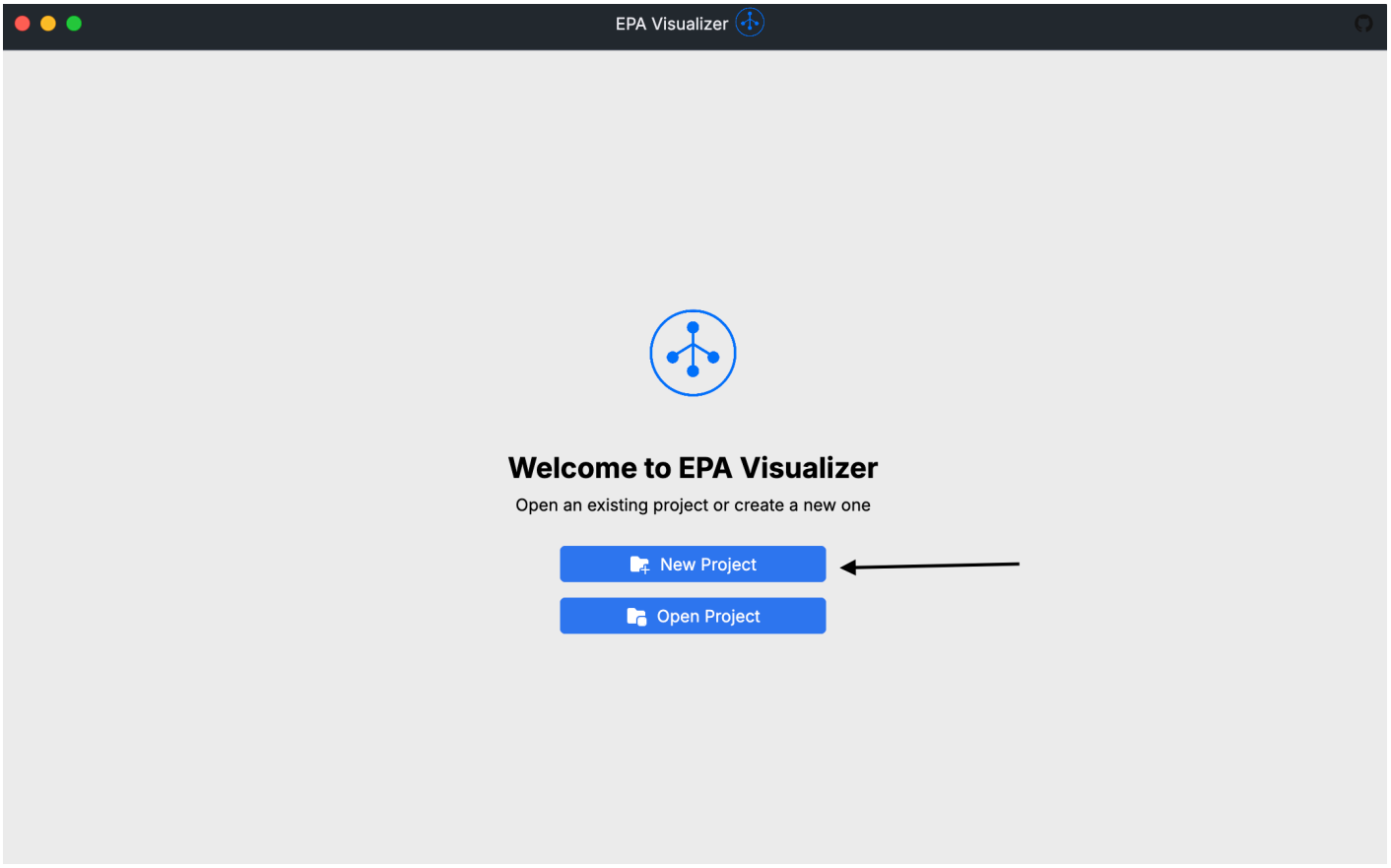
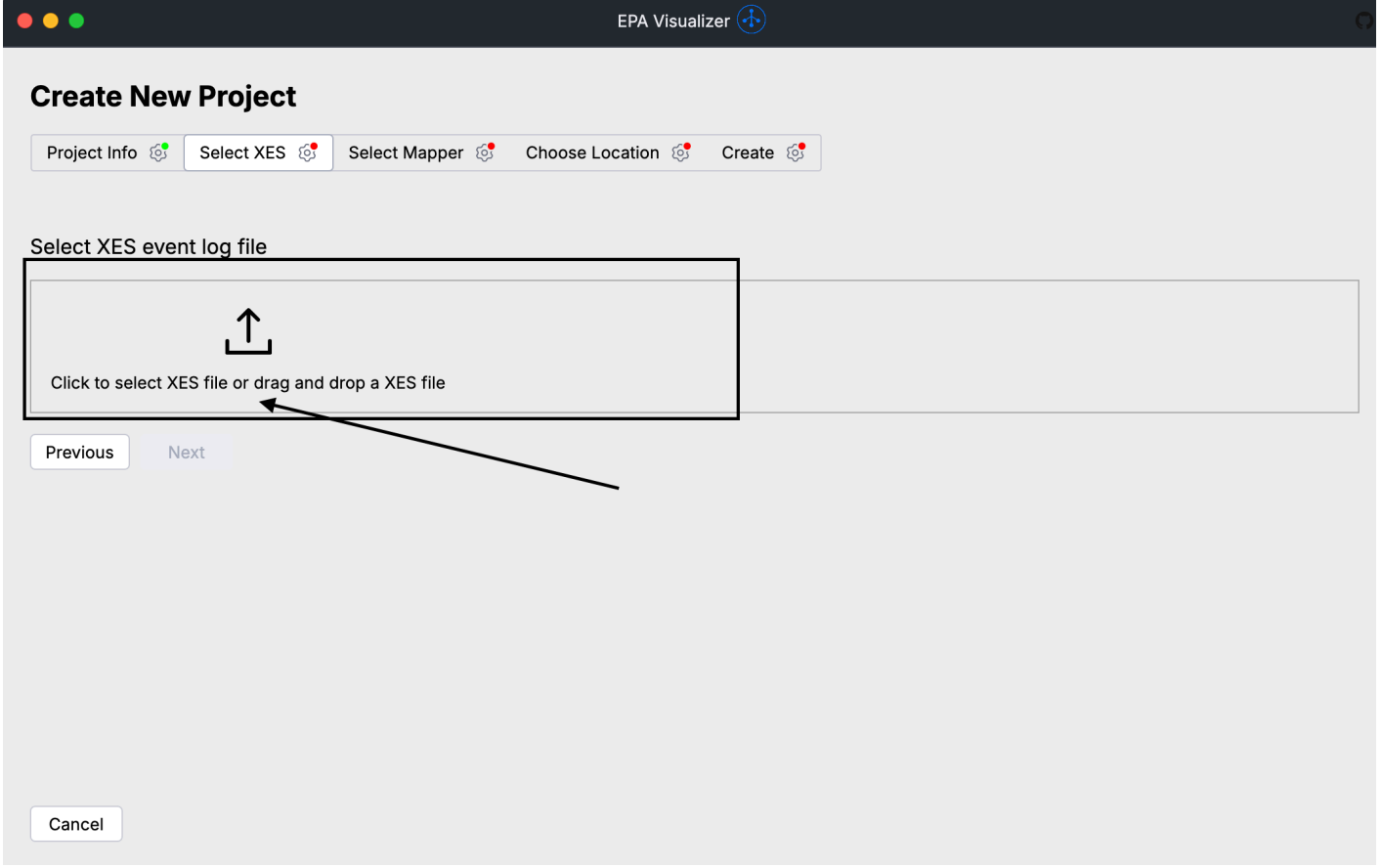
Slide Deck Combined

1. Create A New Project

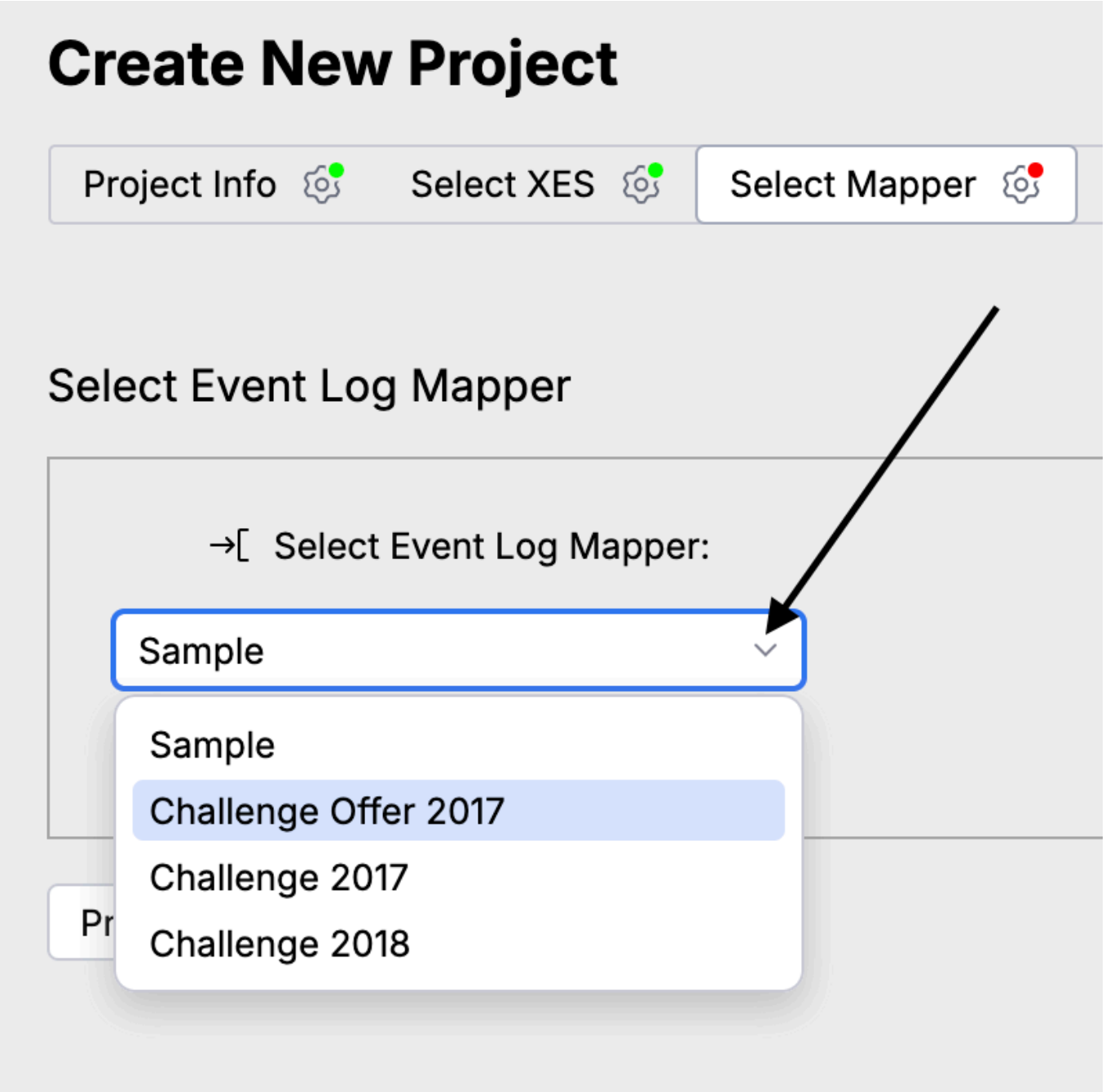
1. New Project Button



2. Enter a project Name and press "Next"
3. Select a Eventlog-File (xes or .xes.gz) by either dragging and dropping the file in the area or by clicking the highlighted area and selecting a Eventlog-File in the File-Selector. Continue with "Next"

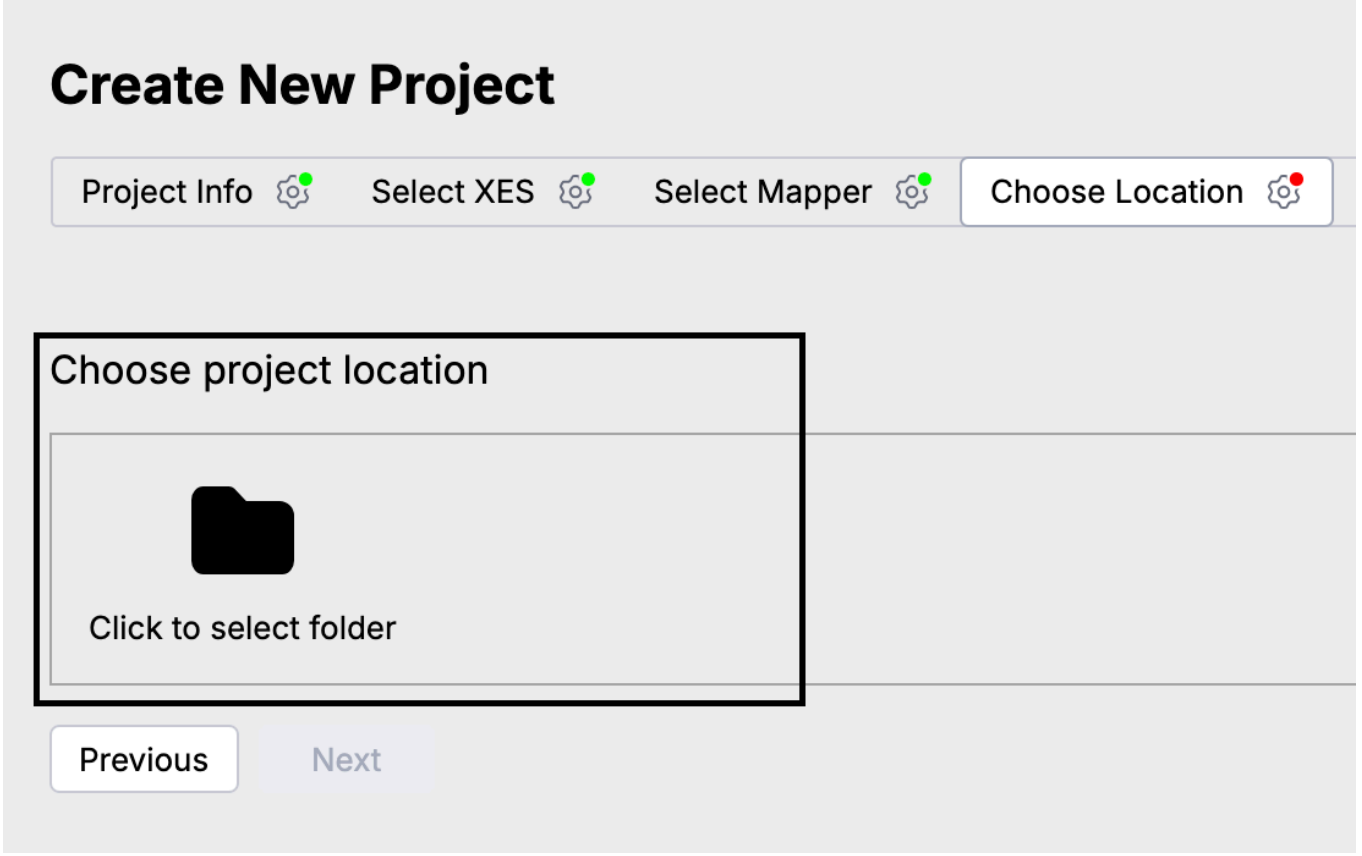

EPA Visualizer
Create New Project
Project Info
Select XES
Select Mapper
Choose Location
Create
Select XES event log file
Click to select XES file or drag and drop a XES file
Previous
Next
Cancel

4. Select the appropriate event log mapper for the chosen Eventlog-File.

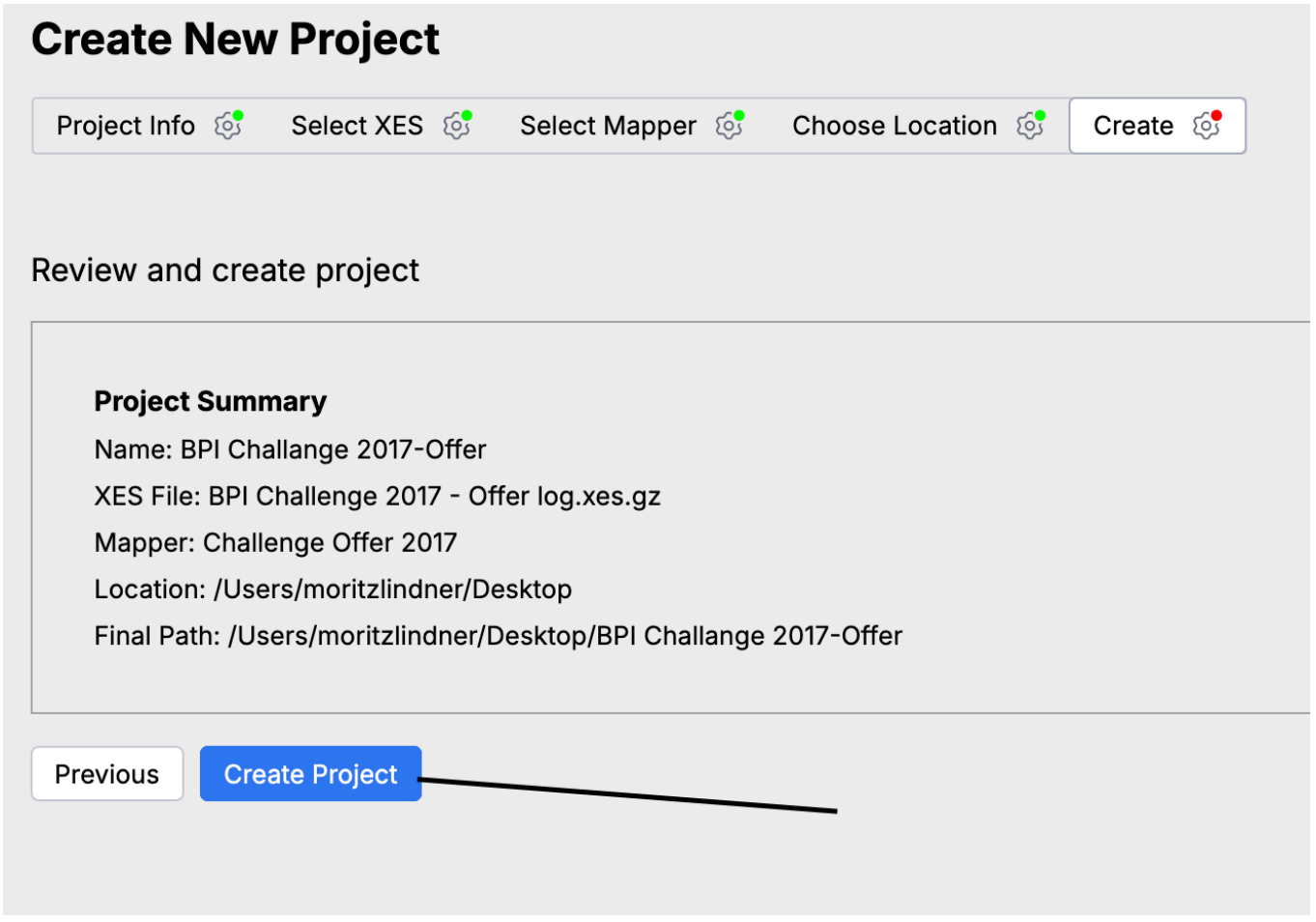


Note: The Event Log Mapper is relevant to transform the raw xes-event format into a format usable by the application. When the wrong mapper is selected here the transformation might fail entirely or produce wrong results.

5. By clicking in the selected area choose a location where the project (the event log file and the configuration should be saved)

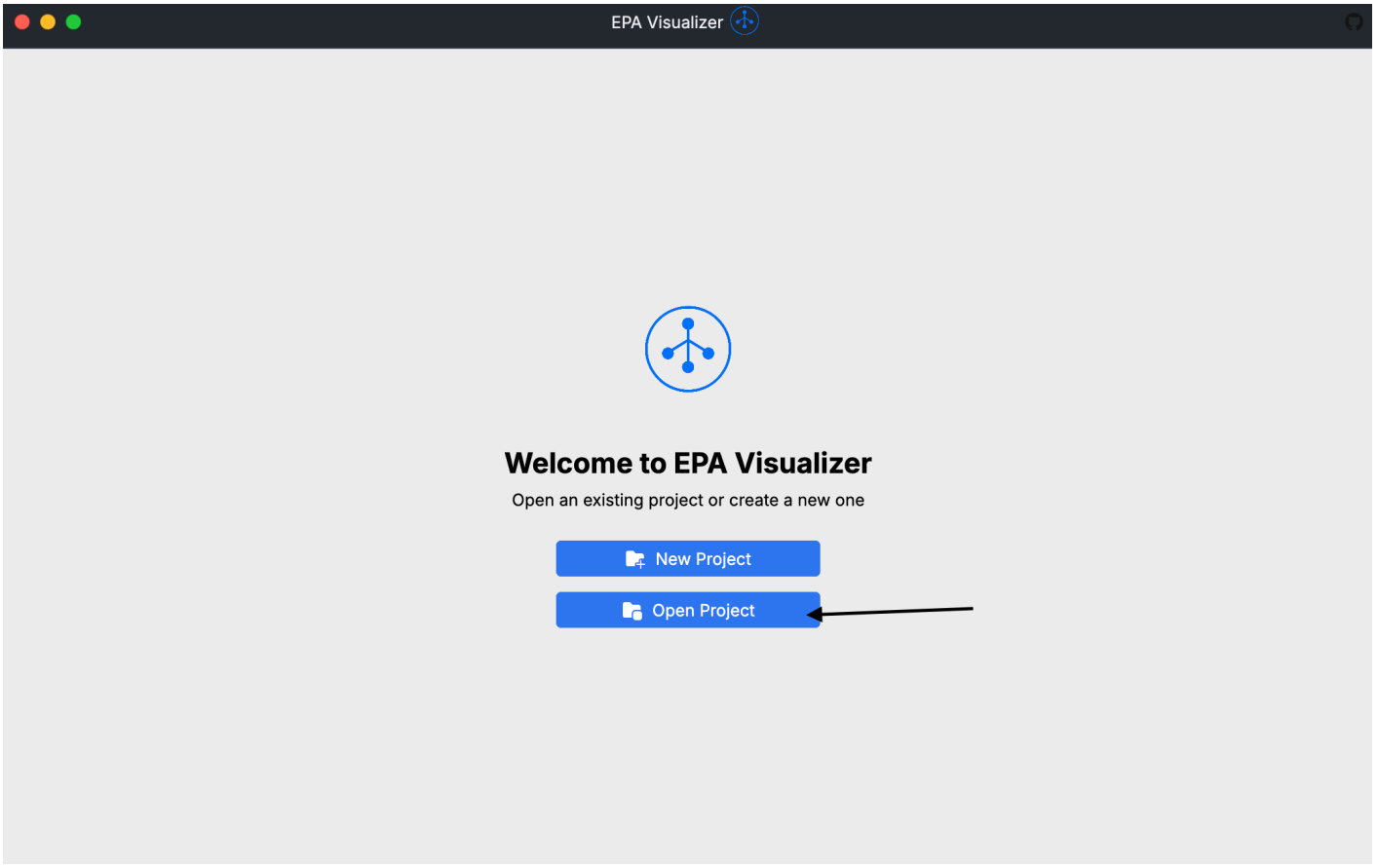


6. Verify the configuration and Create and open the project by clicking "create project"

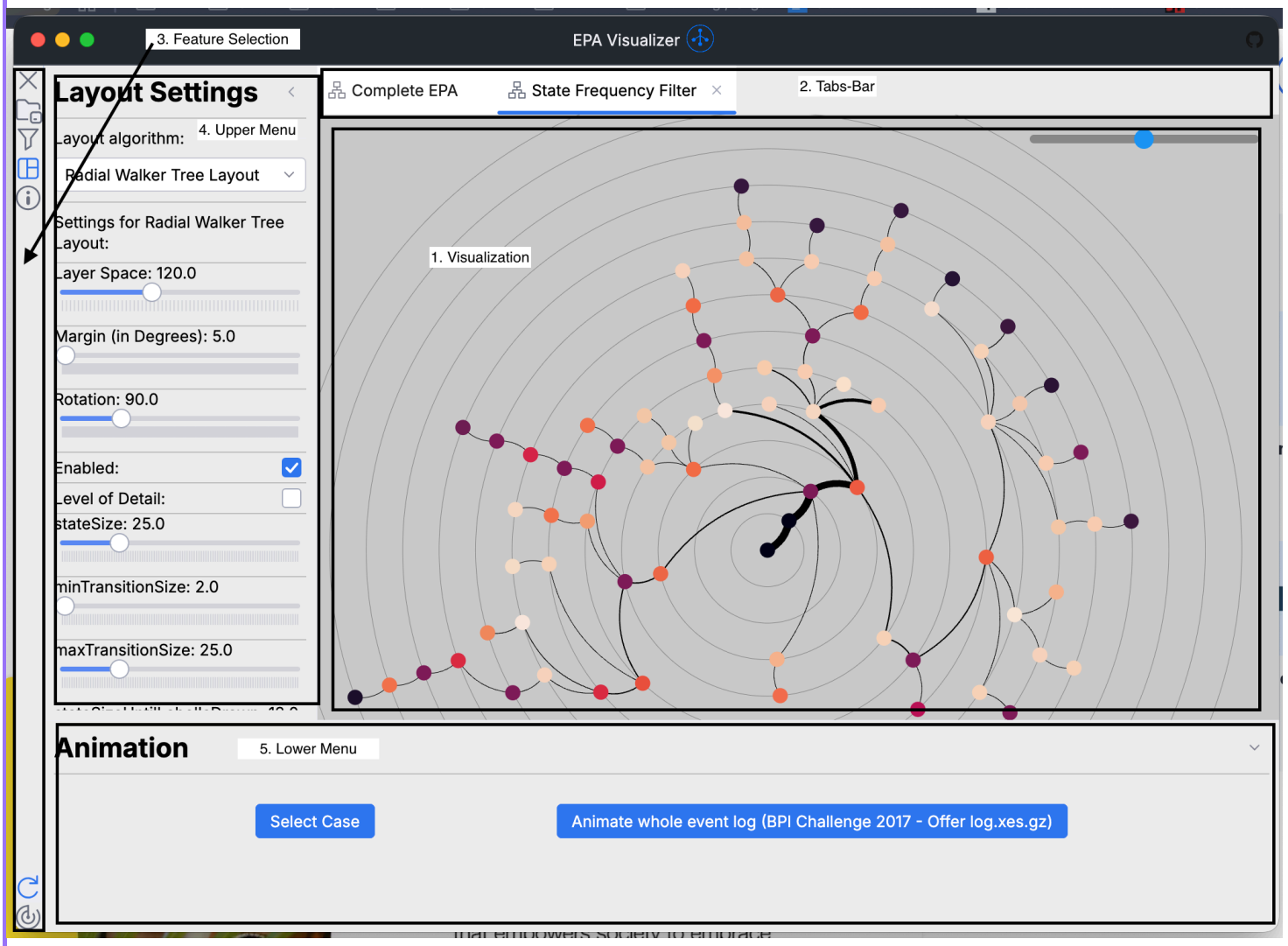


2. Open A existing Project

1. Click "Open Project" and in the directory selector select the directory in which the project was saved



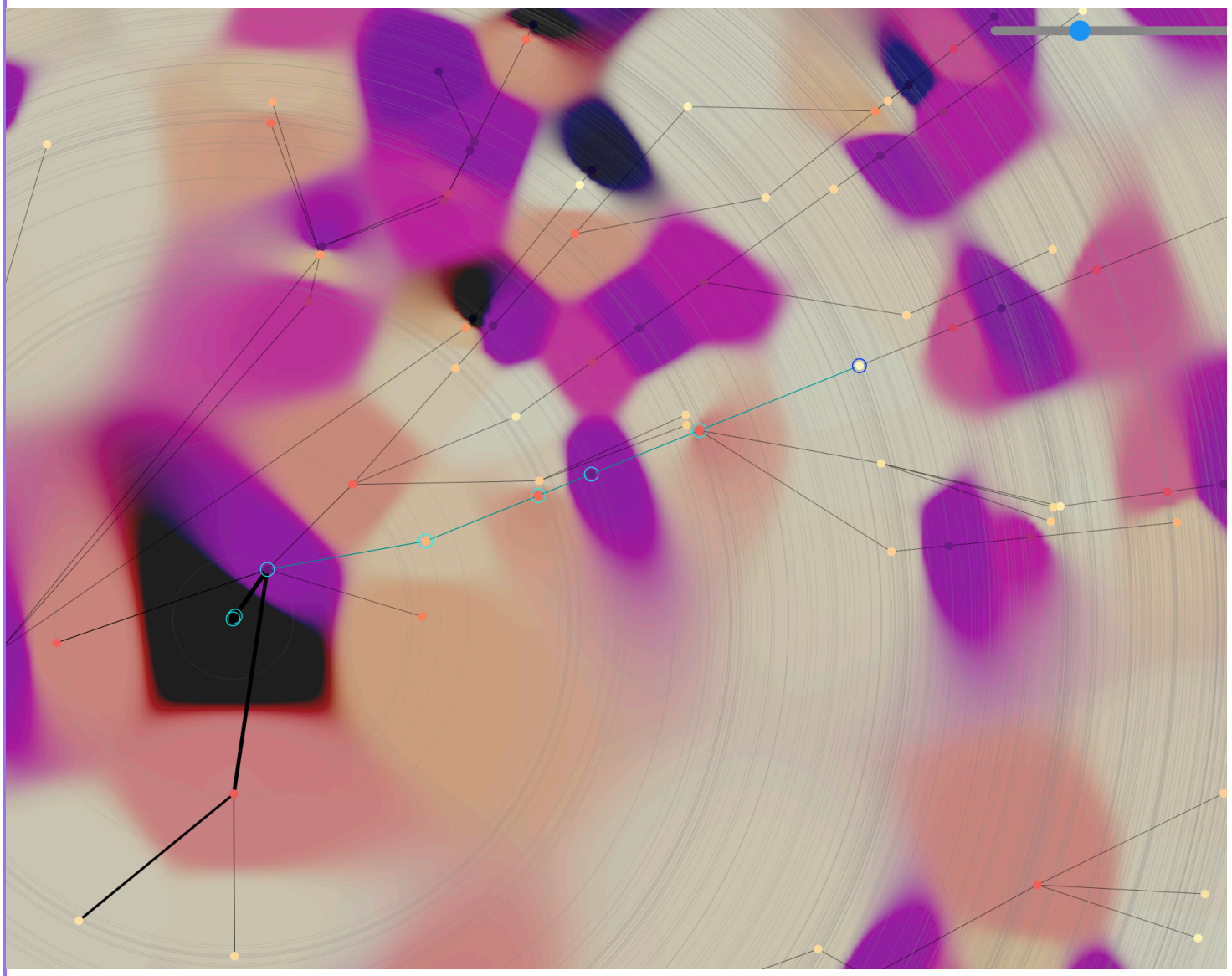
3. Programm UI-Overview



1. Visualization:
   The menu shows the rendered EPA-Visulization
2. Tabs-Bar:
   When using the program the originally constructed EPA can be transformed by filtering it.
   All created EPAs are visible and selectable here. Each tab can be closed, copied or opened in a new window to get a read only view of the EPAs visualization.
3. Feature Selection:
   The bar show all available programs. When selecting one it will open in either 4. Upper Menu (when selecting one of the 4 programs on the top) or in the 5. Lower Menu (when selecting one of the 2 programs from the lower part of the bar)

The following programs are available (from top to bottom):
Top:
1. "Close": Closes the project and opens the Main Menu
2. "Project Settings": Reconfigure the selected mapper
3. "Filter Settings": Configure and apply filters
4. "Layout Settings": Configure and apply a layout to change the visualization
5. "State-Details": View details of the in the visualization selected UI
Bottom:
6. "Animation": See how individual traces or the whole event log runs through the visualization
7. "Statistics": See statistics for the complete epa and if available the epa in the currently selected tab.

4. Visualization

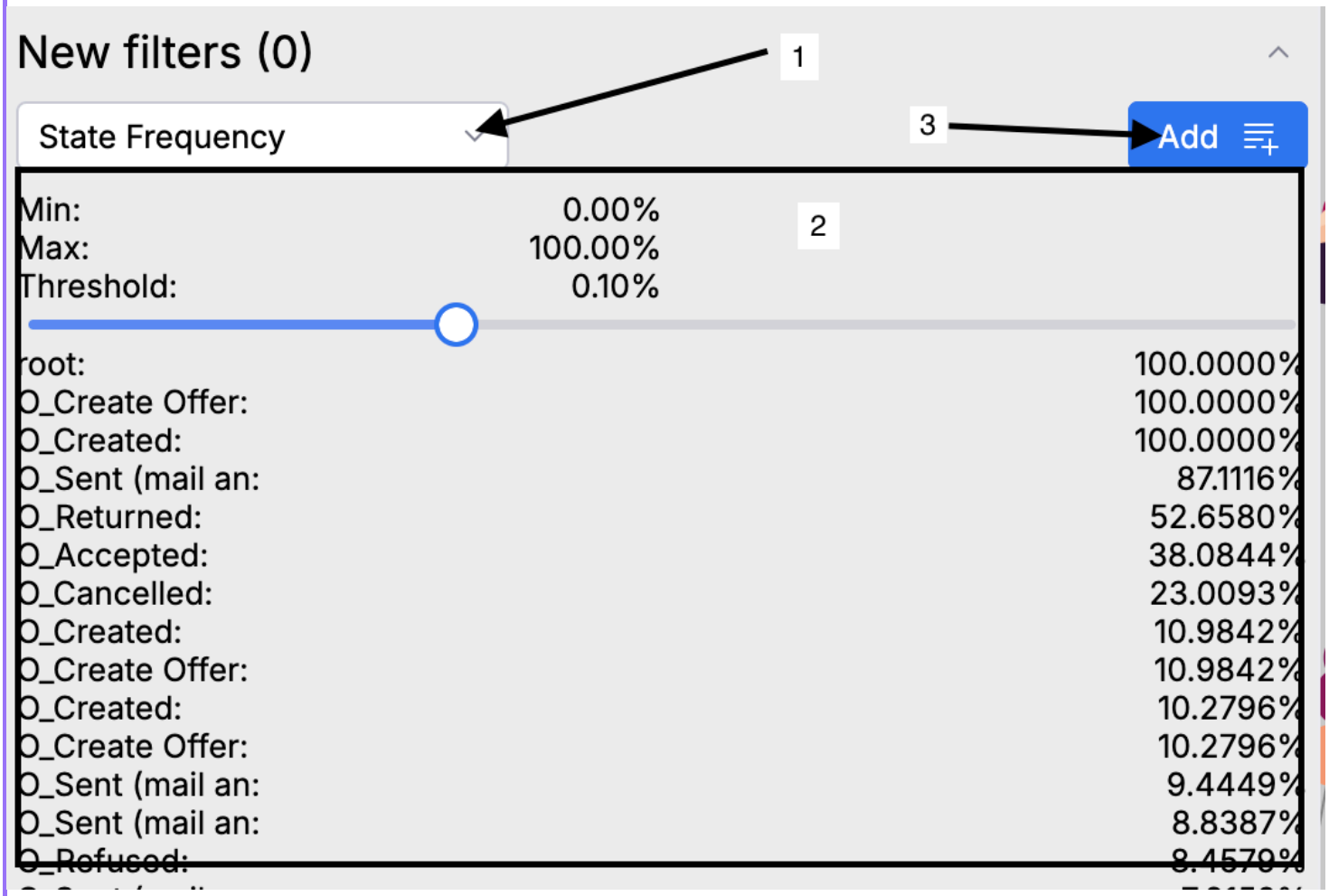


The visualization can be interacted with through several ways.
It can be zoom in and out and panned.
Each state can be clicked in order to highlight the path from root to the current state. The selected state is also the one presented in the "State Details"-Menu (see 7. State Details)

The top right indicates the current zoom level.
Depending on the zoom level state names will be shown or not shown.

5. Filter

A filter can be applied by 1. selecting the type of filter from the dropdown. 2. Configuring the filter followed by clicking the "Add"-Button (3).

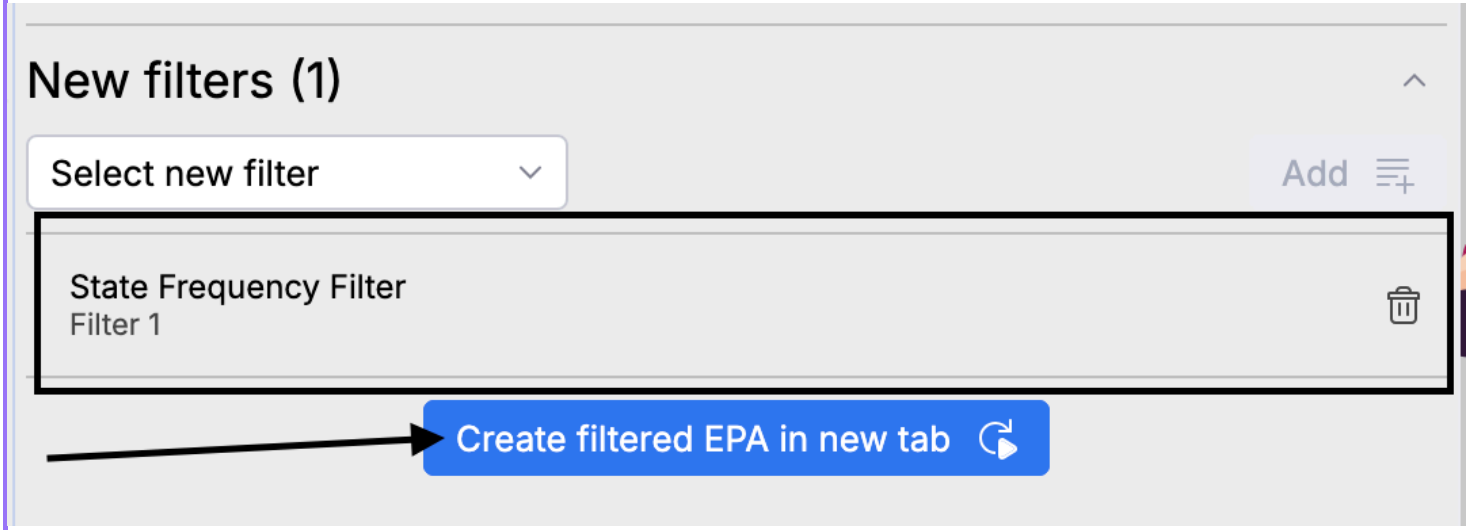


This will put the prepared filter into the highlighted area containing "new filters". It is not applied yet!

If required further filter can be added which will also be shown here.

When a filter is not applied yet it can be removed by clicking the "trash"-icon.

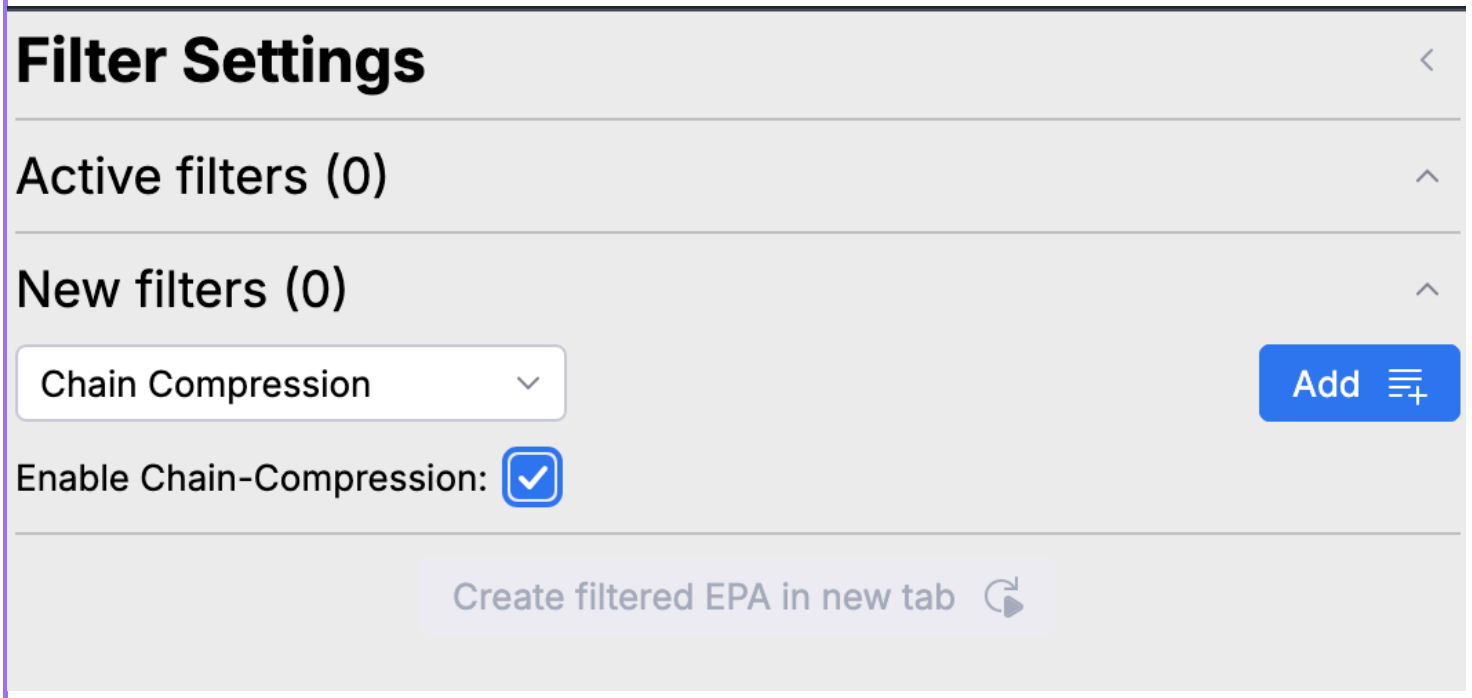
To apply the filters click the "Create filtered EPA in new tab".



The application provides 5 Types of filters. They will be shortly explained here:

Chain Compression

- When enabled the filter combines chains of states meaning subparts of the EPA where states have exactly one outgoing transition ("A" → "B" → "C" will become "ABC")



Partition Frequency

- This filter can remove infrequent partitions from the epa. Each partitions frequency is shown. By moving the slider partitions will be "crossed out" and will be removed when applying the filter.

Filter Settings

Active filters (0)

New filters (0)

Partition Frequency

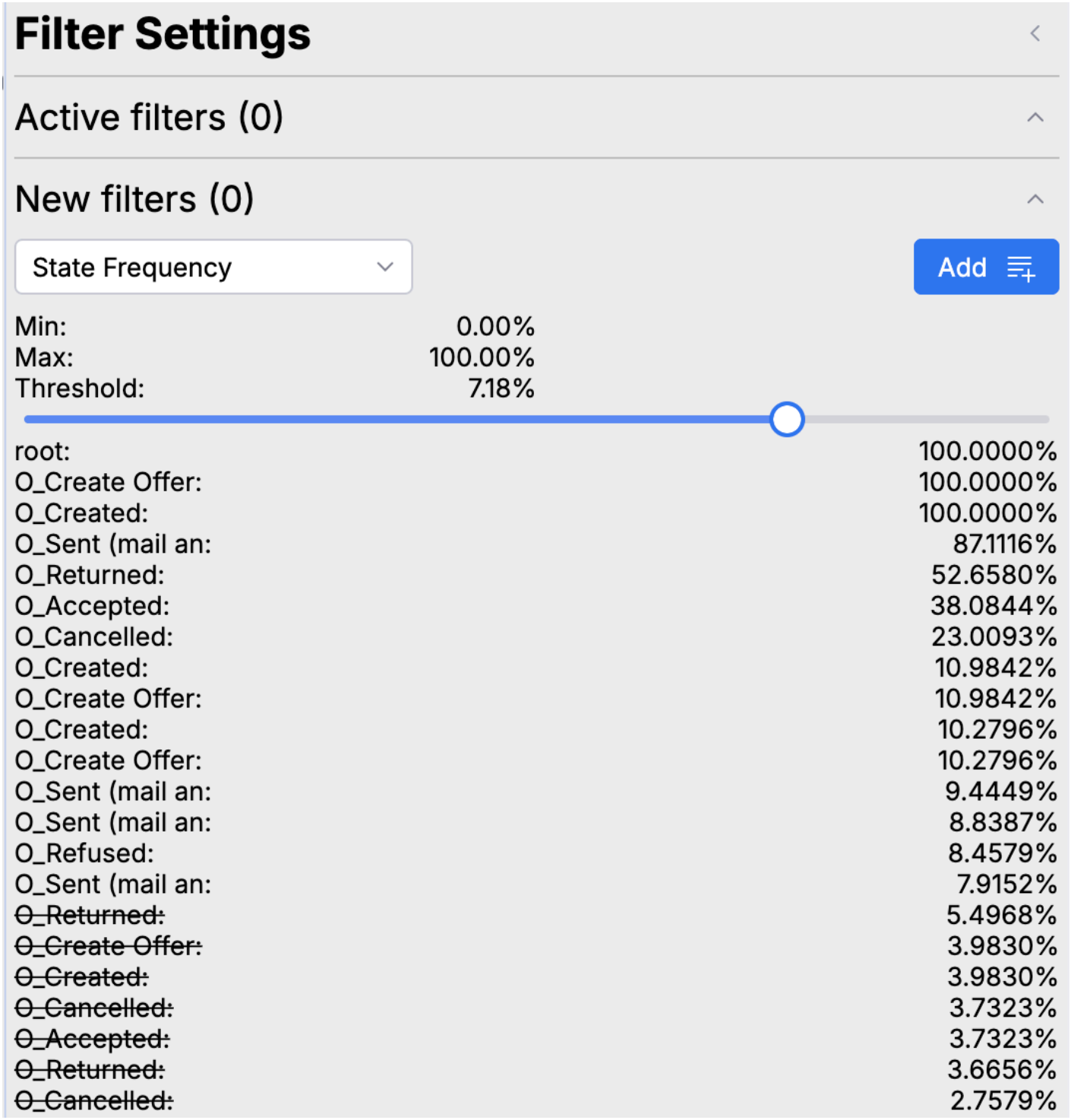
Add

Min: 0.00%
Max: 100.00%
Threshold: 0.82%

Partition 0:	100.00%
Partition 27:	38.08%
Partition 11:	22.64%
Partition 24:	8.46%
Partition 17:	3.74%
Partition 29:	2.55%
Partition 38:	2.55%
Partition 78:	2.13%
Partition 25:	1.99%
Partition 39:	1.44%
Partition 28:	1.09%
~~Partition 35:~~	0.77%
~~Partition 46:~~	0.63%
~~Partition 22:~~	0.56%
~~Partition 41:~~	0.43%

State Frequency

- same as partition frequency but for states



activity filter

- specific Activities can be removed from the epa.
- Be aware this will remove all children after the specific activity. (So removing C from A →B → C → D → E will result in A → B)

Filter Settings

Active filters (0)

New filters (0)

Activity

Add

- O_Sent (online only) ☑
- O_Returned ☑
- O_Sent (mail and online) ☑
- O_Create Offer ☐
- O_Refused ☑
- O_Created ☑
- O_Cancelled ☑
- O_Accepted ☑

6. Layout

Each of the available layout has several, sometimes unique, configuration options. As there are many layouts with many unique settings. Not all will be explain in this guid.

Layout Settings

Layout algorithm:

Cycle-Time Radial Layout

Settings for Cycle-Time Radial Layout:

Enabled:

Level of Detail:

Margin (in Degrees): 5.0

Rotation: 0.0

min radius between connected states: 10.0

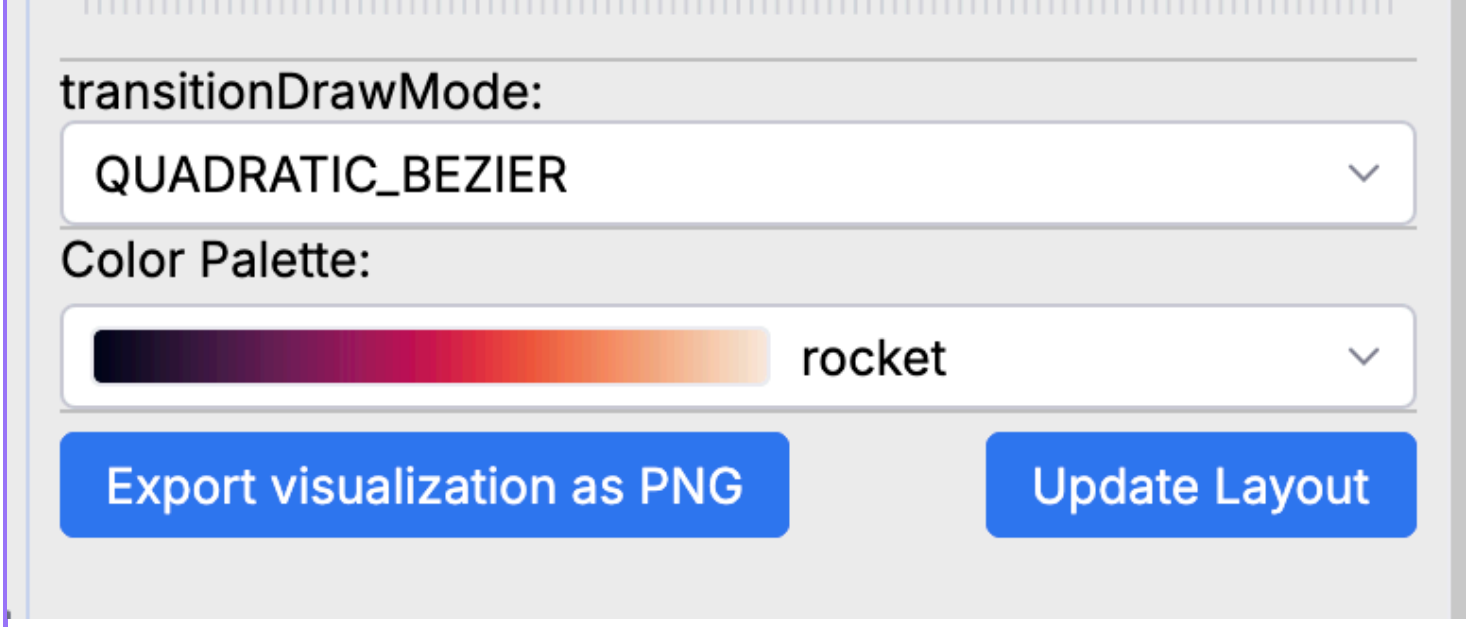
max radius between connected states: 1000.0

stateSize: 25.0

minTransitionSize: 2.0

maxTransitionSize: 25.0

stateSizeUntilLabelIsDrawn: 13.0



Layout Algorithms:
All available layouts are selectable here. When selecting one the appropriate parameters are presented below:

Settings Shared Between (almost all layouts):

- Enabled: When disable the visualization doesnt get rendered which can be useful when the EPA is to large to be drawn with good performance.
- Level of Detail: When enabled states with low frequency are not drawn when the zoom level is far outside to avoid visual clutter
- minTransitionSize, maxTransitionSize: The size of transitions is determined by how often the transition is taken in the event log. The min size determines the size used at the lower end and the max size is the size used at the upper end
- stateSizeUntilLabelIsAreDrawn: Configure at which size state labels will be drawn (larger → drawn earlier / higher zoom level)
- transitionDrawMode: several draw modes are available for the transitions between the states:
  - NONE: transitions are not drawn
  - QUADREATIC_BEZIER: a bezier is drawn between the states
  - LINE: a direct line is drawn between the states
- Color Palette: Different Color Palette can be chosen. The palette is used to color states based on the cycle time. The left part of the palette indicate fast cycle time and the right side indicate slow times. The dropdown menu shows a preview of the palette and the name. The palette is also used in the heat map which is only available in the "Angle- Similarity, Depth-Time RadialLayout"

Available Layouts and important settings

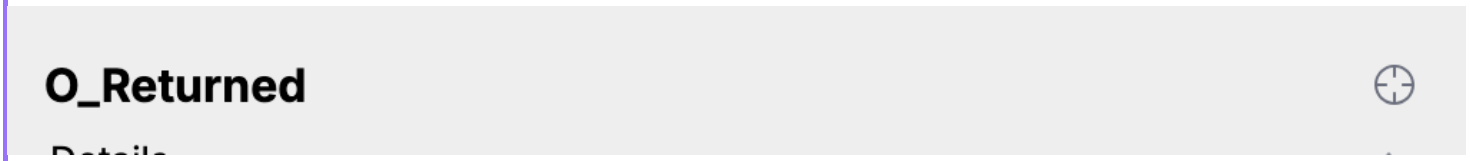
- Walker Layout
- Direct Angular Placement (Radial Layout)
- (Parallel) Readable Tree Layout:
  - initialization: 2 Modes are available for this Layout. "Compact" which creates a layout focused on compactness and "Edge Length" which creates a layout where the distance between the edges depends on the actual cycle time

    - iterations: as the layout uses a force directed approach the number of iterations must set here to configure how often the algorithm will be applied. Warning this can drastically increase the amount of time it takes to create the layout (depending on the amount of elements)
    - minEdgeLength, maxEdgeLength: edge length is determined by cycle time in this layout. minEdgeLength and maxEdgeLength determine the min and max distance between the states
    - *_FORCE_: 3 Parameters are present to configure the force directed improvements algorithm. The algorithm tries to ensure no label overlapp, accurate edge length and generally a good utalization of space. Each parameter configures how strong the algorithm will try to improve the given optimization goal
- State Clustering Layout:
    - This layout creates a highdimensional feature space (embedding) from all states and uses UMAP to create a 2d representation of the space therby showing similarity between different states:
    - Use *: by disabling a use * property it will be removed from the embedding therby not beeing used in the similarity
- Partition Clustering Layout
    - This layout creates a highdimensional feature space (embedding) from all partitions and uses UMAP to create a 2d representation of the space therby showing similarity between different states:
    - Use *: by disabling a use * property it will be removed from the embedding therby not beeing used in the similarity
- Partition-Similarity-based Radial Layout:
    - This layout creates a highdimensional feature space (embedding) from all partitions and uses UMAP to create a 1d representation of the space along a circle. Meaning similar partitions will be placed more closly to each other in the resulting radial layout
- Cycle-Time Radial Layout:
    - This radial layout places the states on radia depending its cycle time
    - min/max radius between connected states: determined by cycle time in this layout. minE radius and max radius determine the in the visualization actual used distance for this.
- Angle-Similarity, Depth-Time Radial-Layout
    - This layout combines "Cycle-Time Radial Layout" and "Partition-Similarity-based Radial Tree Layout"

7. State Details

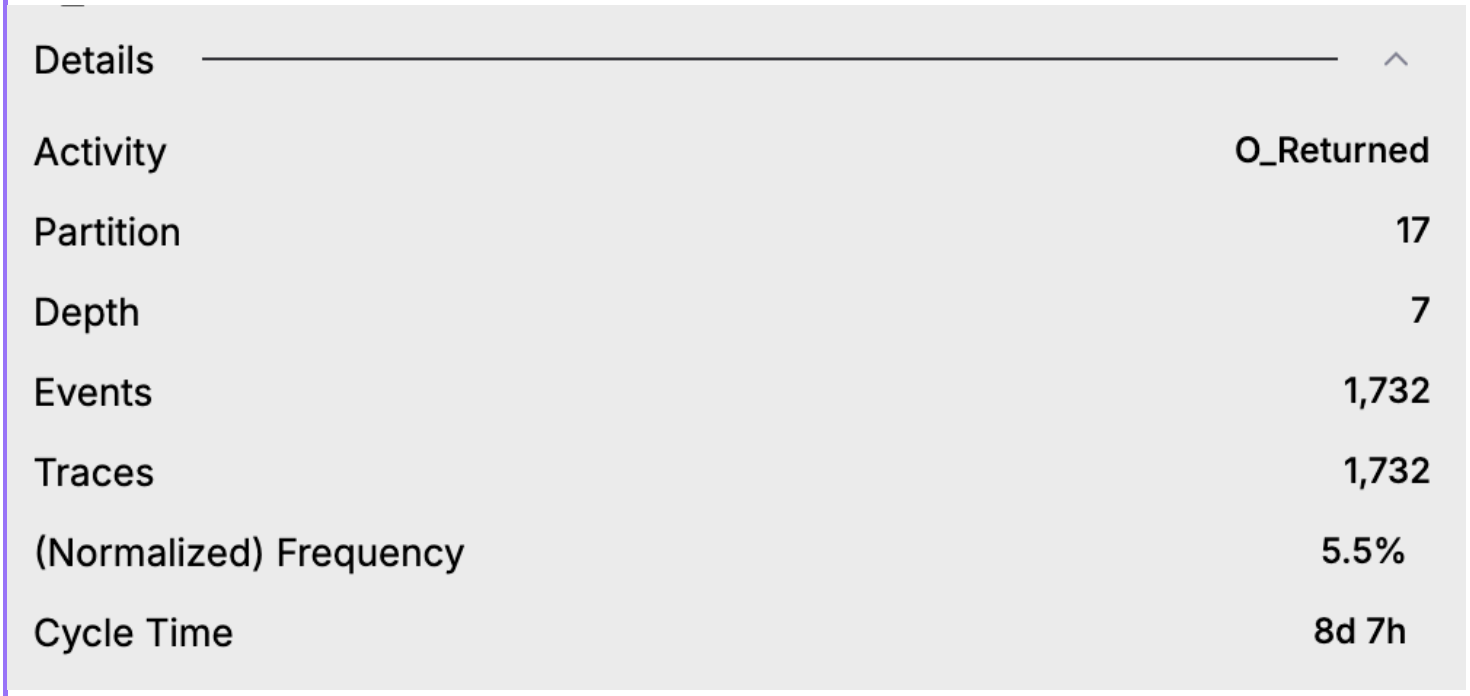
As explained in 4. Visualization individual cases can be clicked in the visualization.
If a case is selected this menu will show many different details for the selected state:

At the top the name of the state is displayed. Pressing the "target" icon on the right side will focus the state in the visualization.



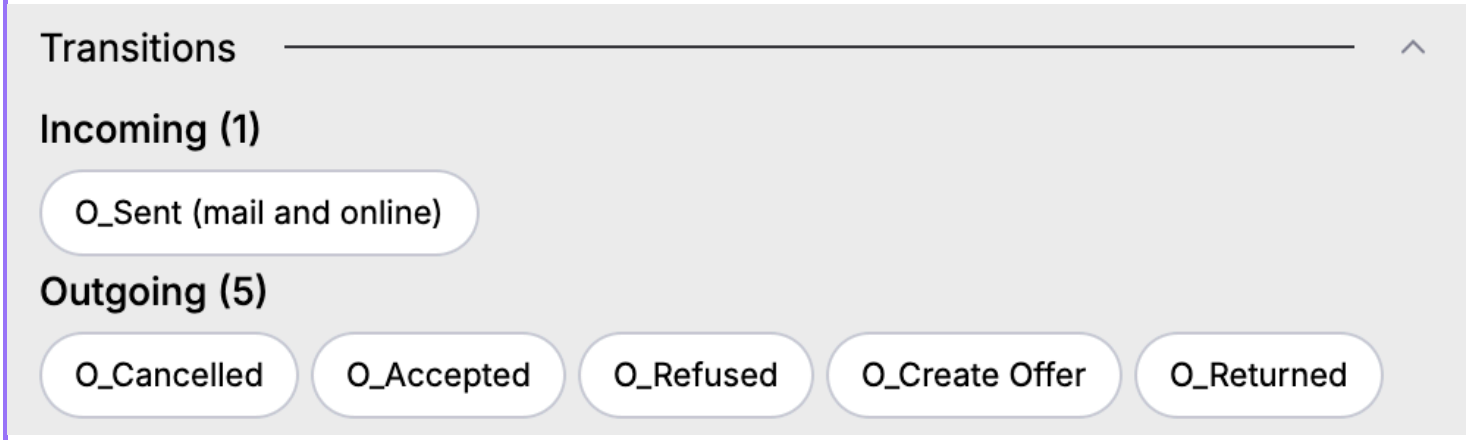
Details

Details shows some general information for the state



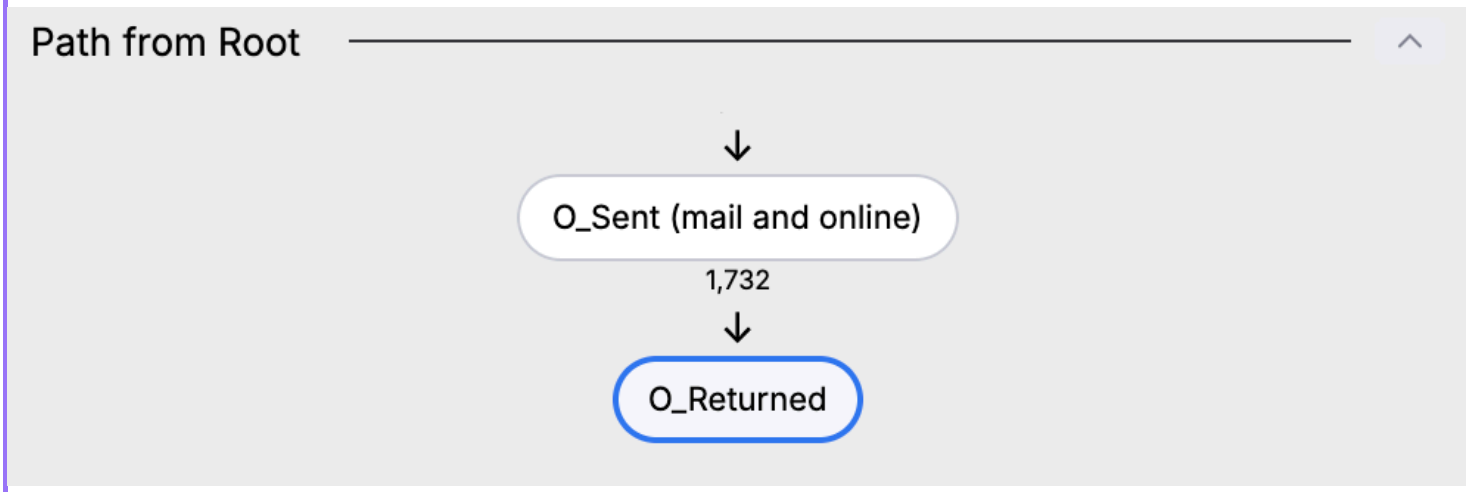
Transitions

Transition shows the incoming and outgoing transitions of the current state.
Pressing one of the listed states will result in that state being highlighted therbey allowing you to navigate through the epa.



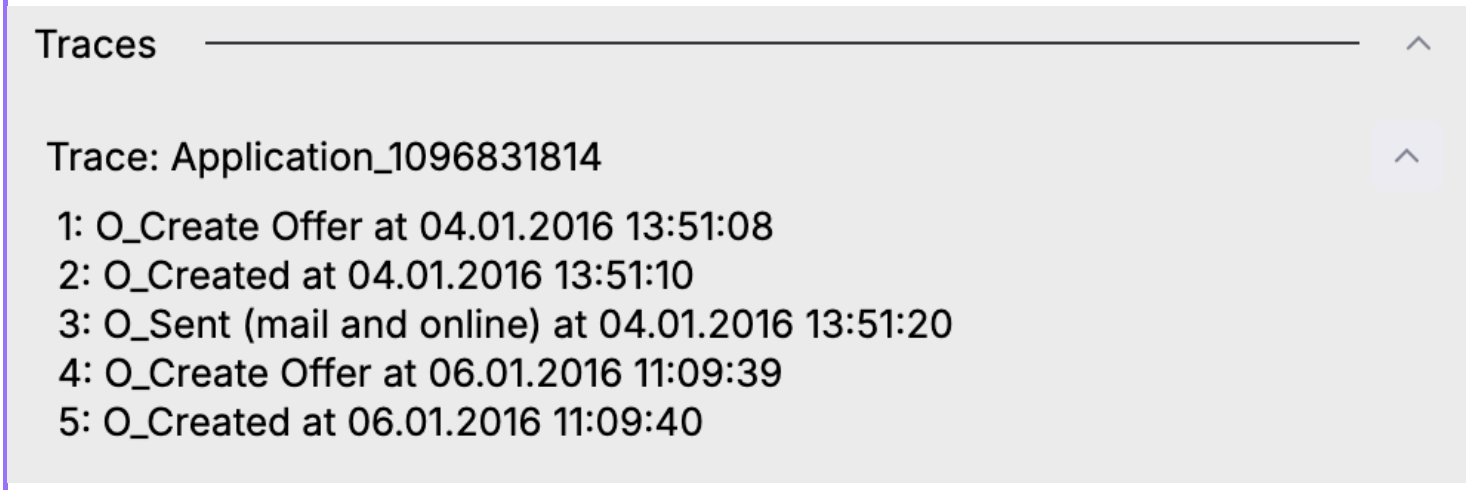
Path from root

Path from root shows the path from root to this state and the amount of events for each transition in this path. Each state is also clickable / navigateable



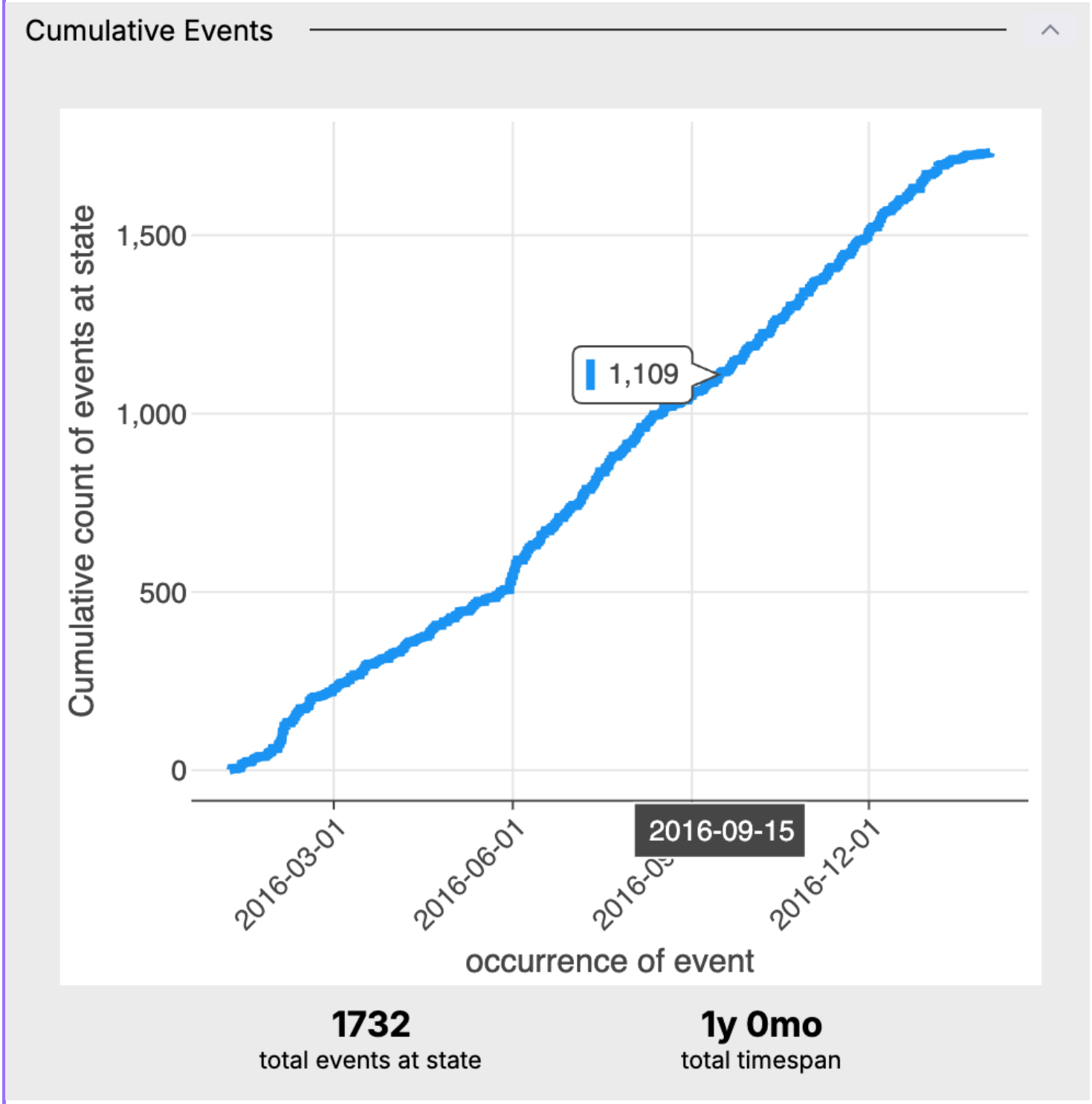
Traces

Traces shows each trace belonging to the state. Each trace can be expanded showing each event of the trace with its timestamp. The even(s) at the state will be bold.



Cumulative Events

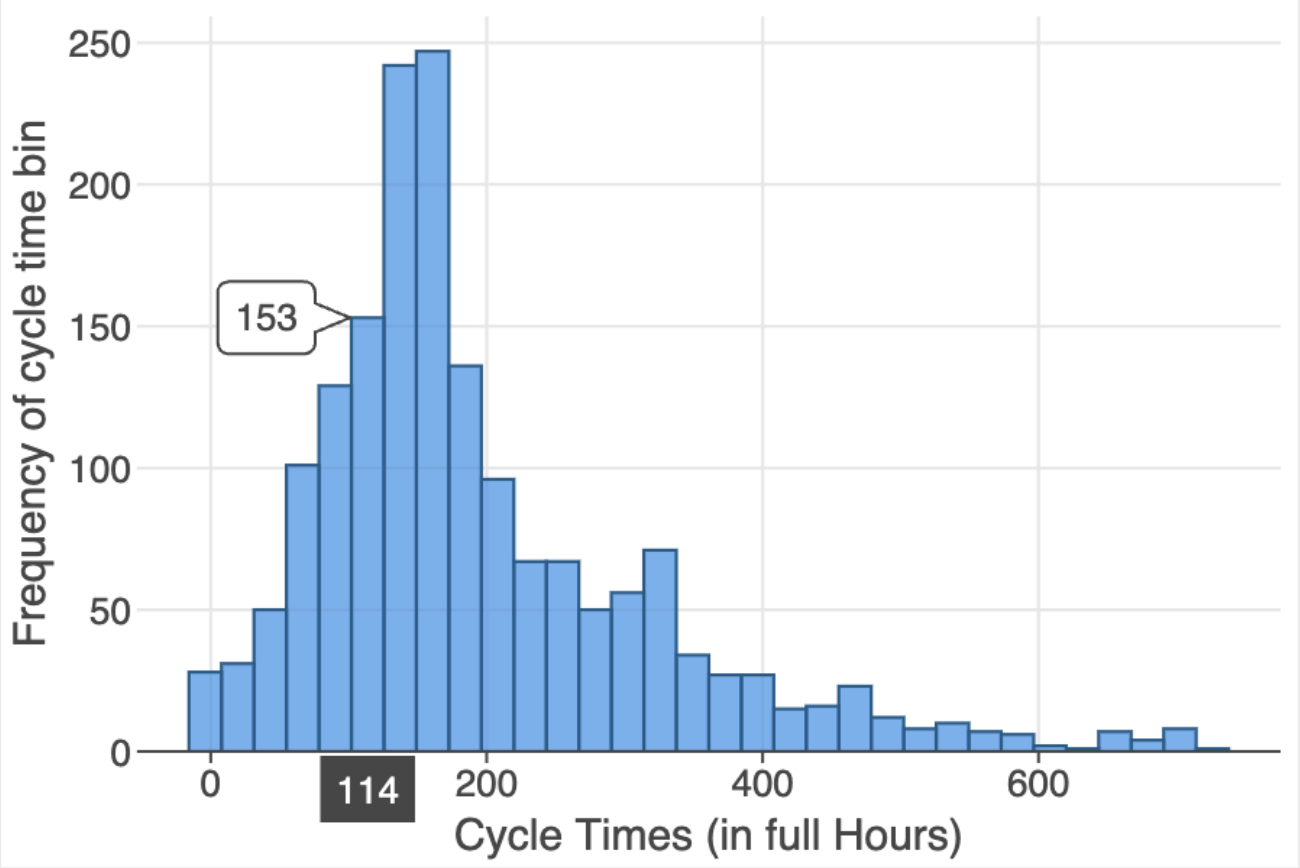
Shows a graph indicating the amount of events "recieved" at the state for the given timestamp.



Cycle Time Histogram

Shows not only the cycle time (which is a average of all) but also also a histogram of the present cycle times at the state.

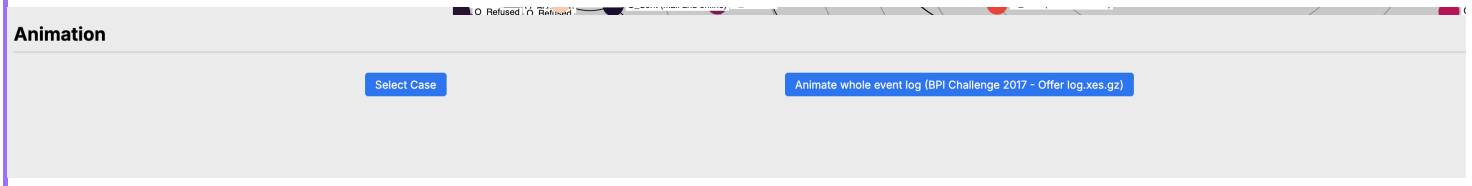
Cycle Time Histogram



7m	8d 7h	30d 2h
Min	Average	Max

8. Animation

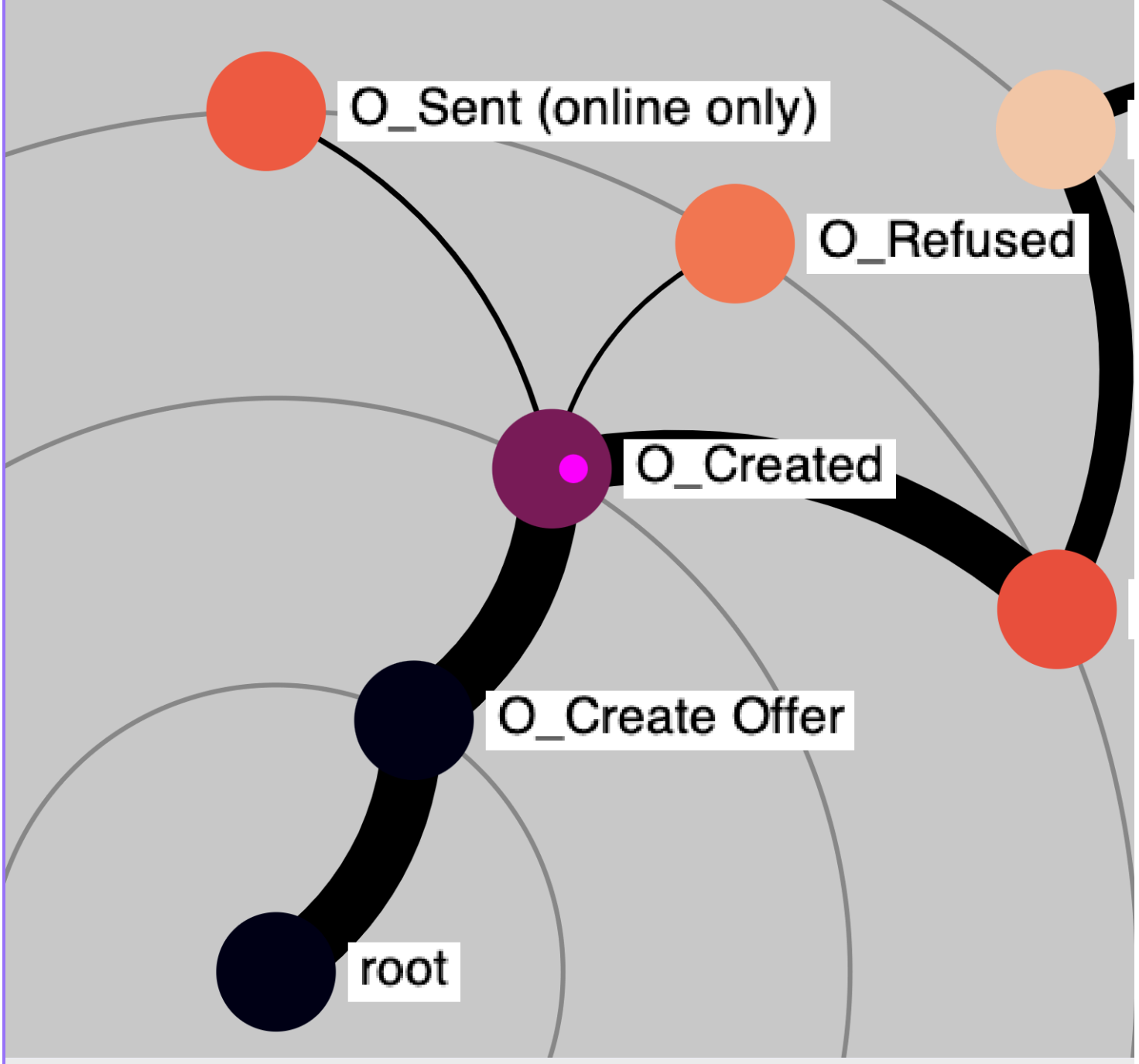
Single-Case animation

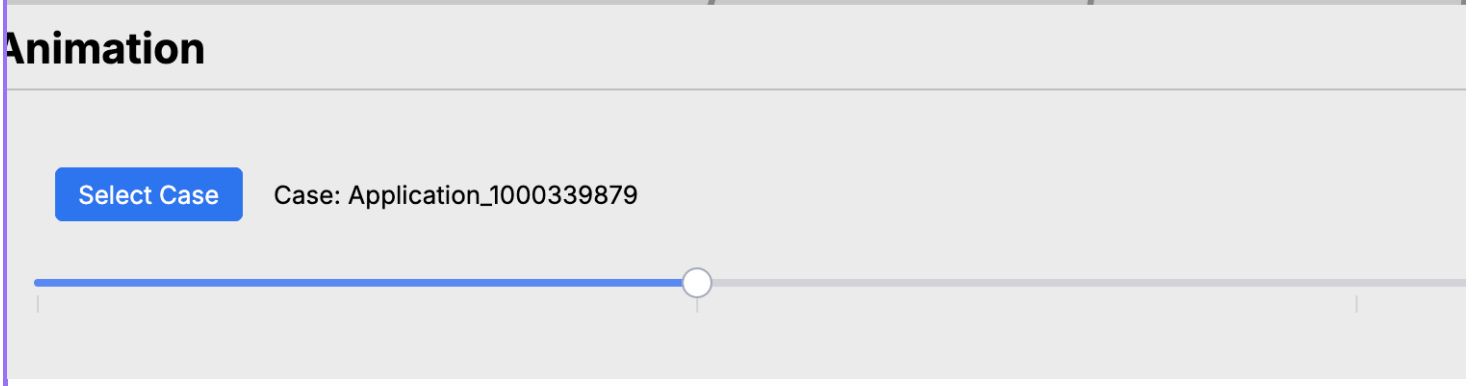


Click "Select Case"

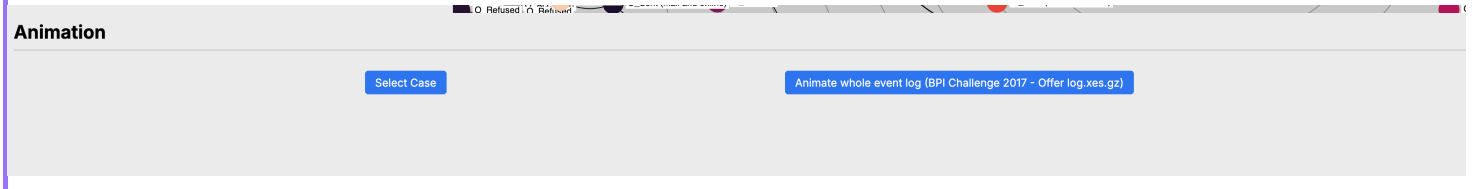
Choose a case from the dropdown menu!

In the lower bar a slider appears which can be used to move the case through time.
A small dot will appear indicating the state of the epa at this event.





Whole Log Animation

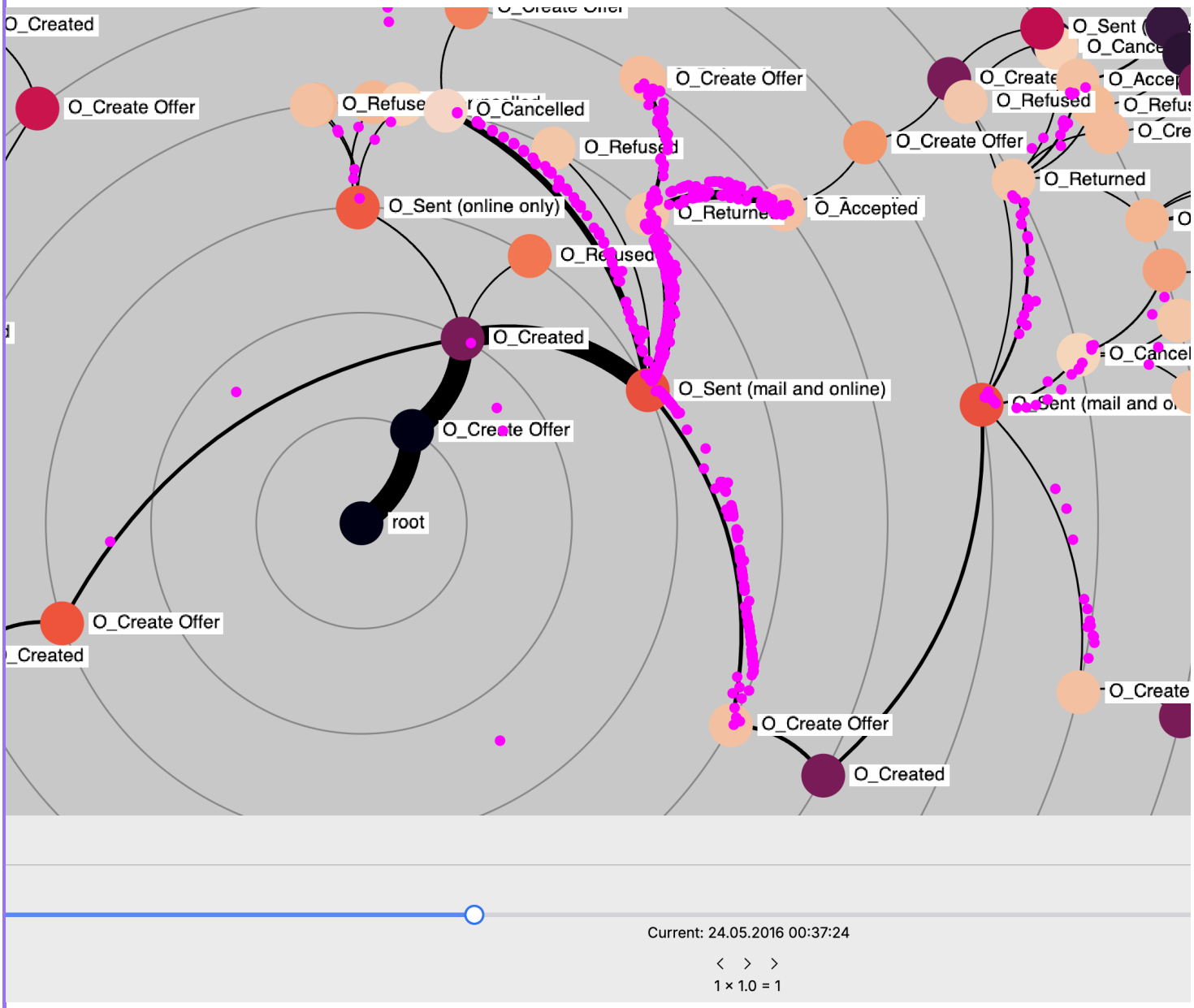


Click "animate whole event log"

A slider will appear. It can be dragged to move the animation through time (first event in log to last). The current time is indicated in the middel.

The animation can also be played back by pressing the "play" button in the center.

During each point in time the visualization will show all positions of each case at this point in time:



9. Statistics

Statistics shows several key numbers regarding the epa. On the left side the "root"/original EPAs numbers will be shown. The right side presents numbers based on the currently opend epa.