

# Administrator's Guide

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Version 4.0

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## Introduction:

ThreadLocker is a CPU balancing application written for Server Based Computing (SBC) and Virtual Desktop Infrastructure (VDI) environments.

Regularly, in both SBC and VDI environments a single process utilising all available cores (multithreaded) or multiple processes consuming a CPU's worth of computing power each (single threaded) can cause lags, pauses and hangs to the connected user (VDI) or to the other users on the shared desktop (SBC) while these processes consume vital resources.

ThreadLocker will ring-fence CPU resources for the system, preventing CPU resources being compromised by a single, or a number of processes.

ThreadLocker can use Processor Affinity (the CPU's a process can run on) to isolate processes to a subset of cores and therefore preventing a single, or number of processes from consuming all the resources in a machine.

Once a process bursts or the total system CPU usage reaches a configured threshold for the number of samples you predetermine, the process or processes will have the configured actions applied to them.

The following actions are available to perform on a process or group of processes:

- Configure which CPU cores are available to run on
- Configure the maximum amount of CPU that can be consumed
- Adjust the priority
- Notify the owner of the process or processes that an action has been applied

*Note: Non ThreadLocked processes are free to use all available cores in the system.*

## ThreadLocker Requirements:

ThreadLocker has a specific set of requirements detailed below:

- Windows 7 / Windows Server 2008 R2 and above
- At least 2 CPU cores (to utilise affinity actions)
- .NET Framework 4.5

## Licensing

ThreadLocker has 3 licensing options:

### Community Edition

Community edition does not have the intelligent CPU monitoring aspect and not be managed by the ThinScale Management Platform. It only operates with a list of static rules as defined by the administrator for known troublesome processes.

### Trial

When ThreadLocker is first installed, it will install a 30-day license trial for you to test the entire product. A trial license can also be used with the ThinScale Management Platform to evaluate the functionality.

When the trial expires, you must request an enterprise or community license and publish this license to the client to continue to work undisturbed. You can request licensing information from [sales@thinscaletechnology.com](mailto:sales@thinscaletechnology.com)

### Enterprise and Enterprise Plus

Enterprise licenses entitle you to extra functionality. Details of these features can be found at <https://www.thinscale.com>

You can request licensing information from [sales@thinscale.com](mailto:sales@thinscale.com)

## Profile Sources

ThreadLocker's configuration settings are stored in a profile, this profile file is stored locally and can be modified with the ThreadLocker Profile Editor.

The profile (TLProfile.json) is located in the installation directory. This file is directly editable via the ThreadLocker Profile Editor Utility. *(please see the Profile Editor Section for more details).*

Alternatively, you can have the configuration centrally managed by connecting ThreadLocker to the ThinScale Management Platform.

**Note:** If configured to use the ThinScale Management Platform ThreadLocker will keep a local copy of the profile it receives just in case it loses access to the Management Server. This allows ThreadLocker to work offline for extended periods without interruption.

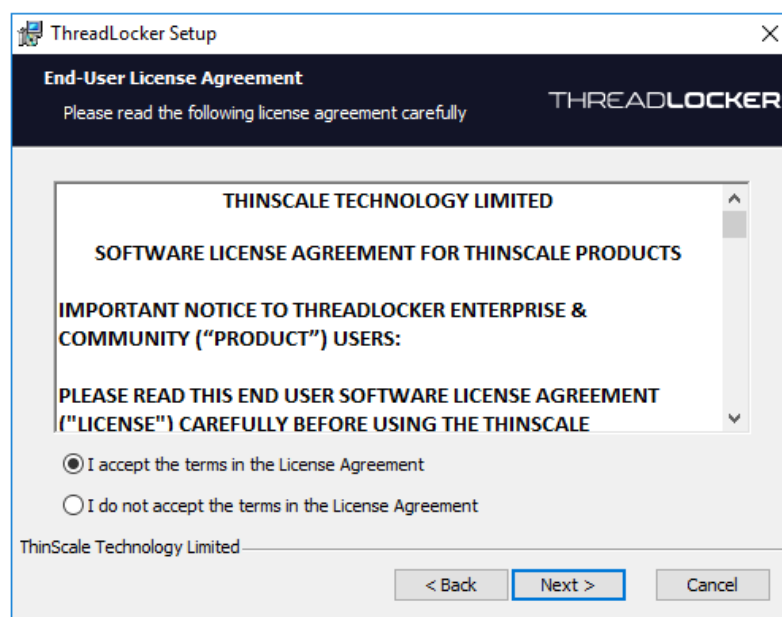
## Enterprise Edition without the ThinScale Management Console:

ThreadLocker Enterprise v 4.0 has no reporting capabilities but all the functionalities, rule-based settings and system wide option are still available to be used. You will have to set an individual profile for each ThreadLocker installation, however it will be possible to deploy the TLProfile.json file with any deployment tools if a replication of same setting between multiple servers is desired. Alternatively, a manual copy between one machine to the other is also possible.

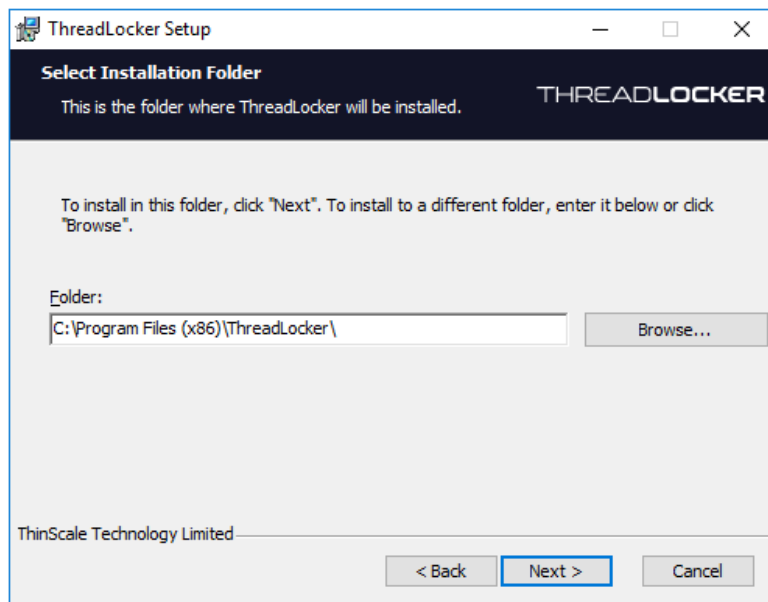
## Installing ThreadLocker with a local profile:



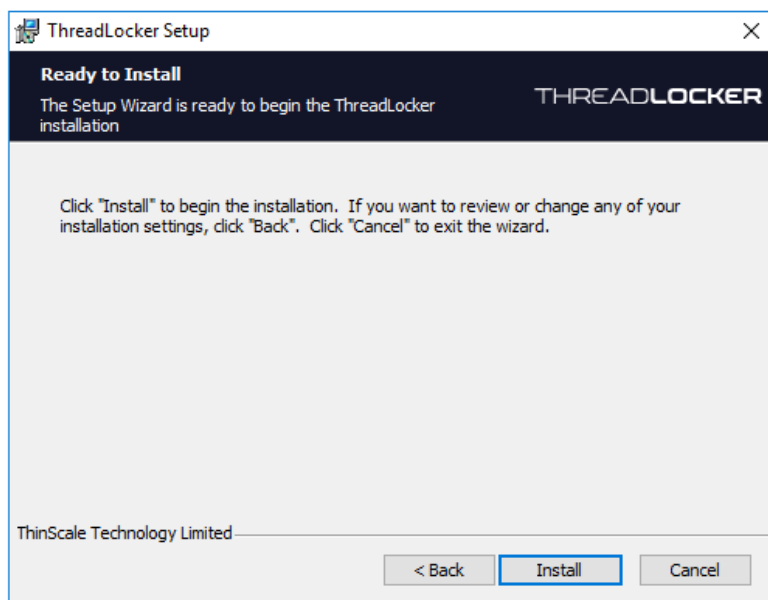
Click Next



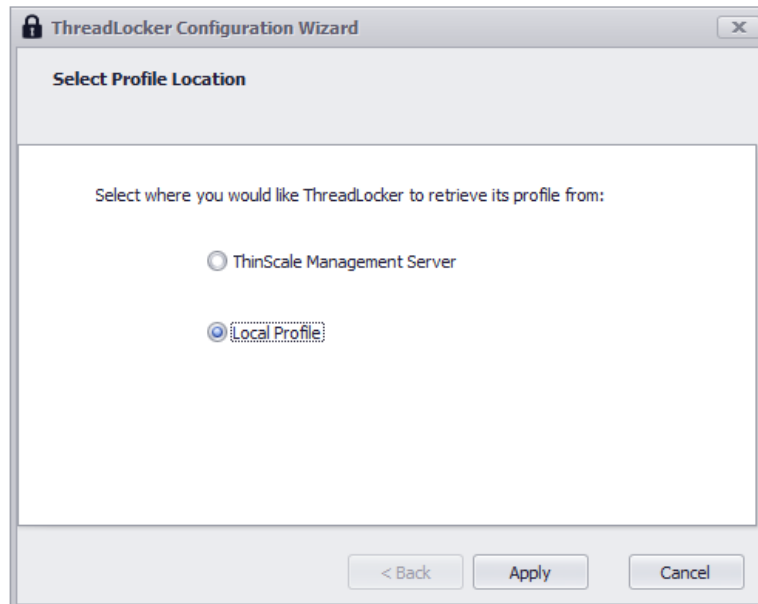
Accept the End-User License Agreement and click Next.



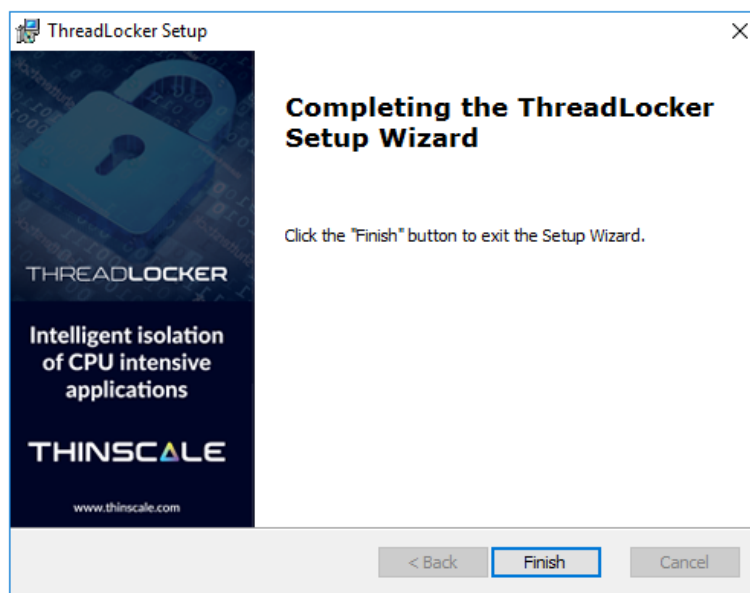
Select the destination installation folder and click 'Next'



Click Install and you are almost done



When installing a standalone ThreadLocker select Local Profile, click Apply and you are finished.



A reboot might be required after Finish.

## Enterprise Edition with the ThinScale Management Console:

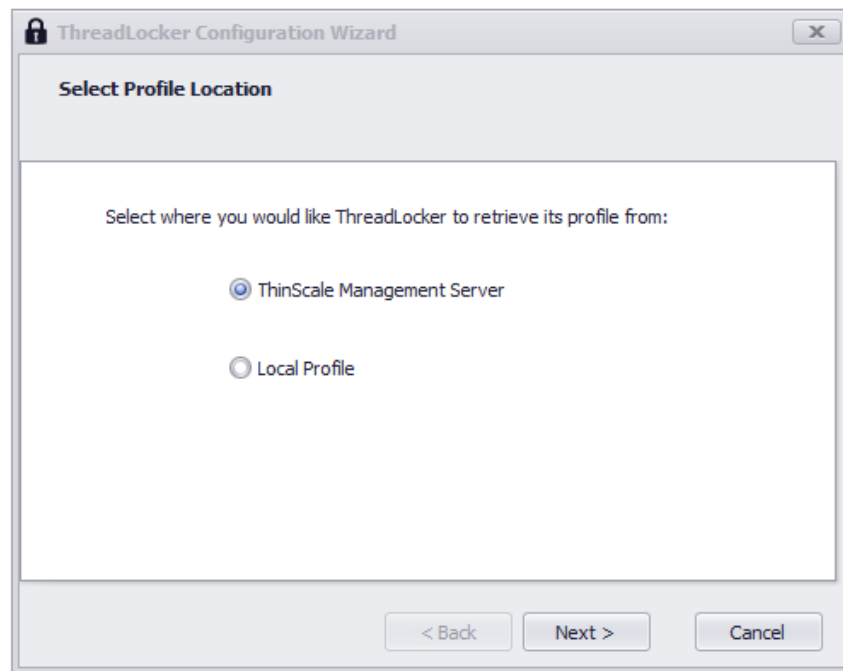
ThreadLocker Enterprise v4.0 together with the ThinScale Management Platform 2.0 lets you create a centralized environment for controlling and monitoring every single device connected to it. Centrally deploy configurations to all your devices and view monitoring and reporting data for your entire estate from a single management console.

Simply select the reporting tab within the Management Console to view CPU Usage, user counts and details on what actions ThreadLocker has been applying to your systems when your configured thresholds have been met.

*(for more information on Management Platforms reporting capabilities, please see the ThinScale Management Console Administrators Guide)*

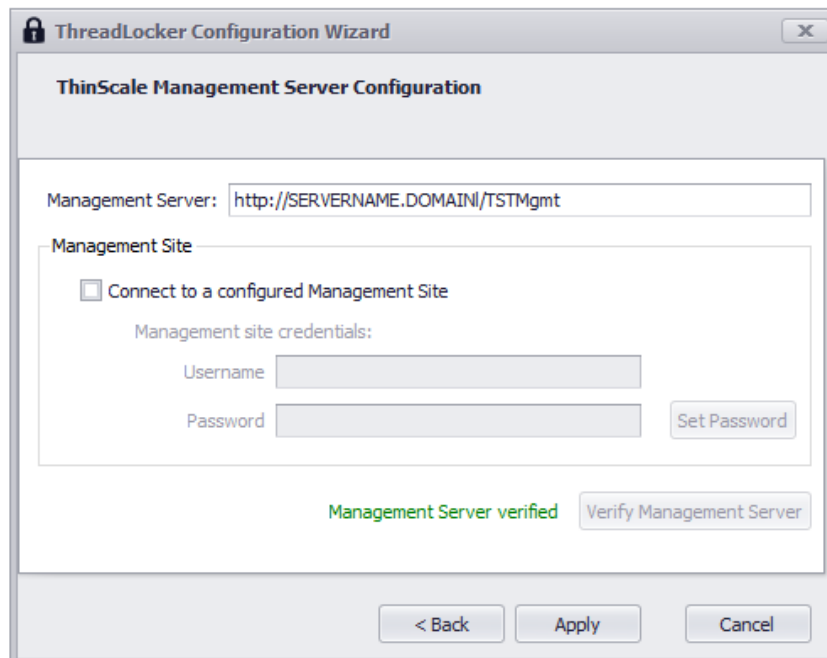
## Installing ThreadLocker connected to the Management Platform:

The installation steps to connect ThreadLocker to the Management Server are the same as standalone installation, the only difference is the use of ThinScale Management Server section.



Select the ThinScale Management Server option and click Next.





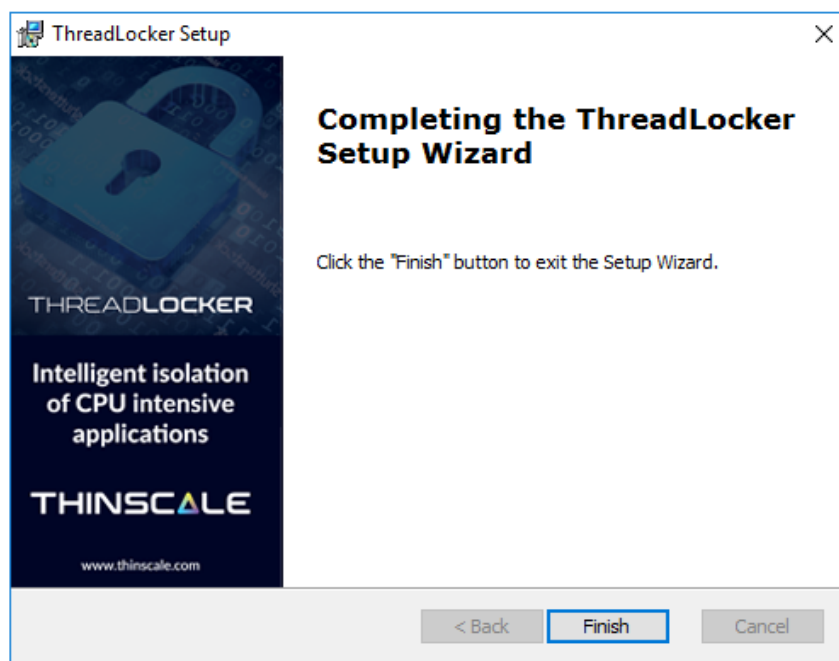
Enter the Management Server's URI

To connect to the 'Default Site' within the Management Console, leave 'Connect to a configured Management Site' unselected. If want to connect to an alternative site you have created, select 'Connect to a configured Management Site' and enter the credentials of the site.

*(Note: for more information on Management Server Sites, please refer to the ThinScale Management Console Administrators guide)*

Click 'Verify Management Server'

Click 'Apply'



Click 'Finish'

## Silent installation:

ThreadLocker's installation MSI supports silent installation for both a local profile and connecting to the Management Platform

## Silent install options

Command Line Option	Description
<b>CONNECTIONTYPE</b>	Configures the ThreadLocker profile source 0 = ThinScale Management Server 2 = Standalone
<b>MGMTURI</b>	The address of a ThinScale Management Server e.g. <a href="https://tstmgmtserver.domain.local/TSTMgmt">https://tstmgmtserver.domain.local/TSTMgmt</a>
<b>MGMTDEFAULTSITE</b>	Configures ThreadLocker to connect to the 'Default Site' in the Management Platform 1 = Use Default Site
<b>MGMTUSERNAME</b>	The username associated with the Management Site you want this ThreadLocker device to connect via. <i>(for more information on Management Sites, please see the ThinScale Management Console Administrators Guide)</i>
<b>MGMTPASSWORD</b>	The password associated with the Management Site you want this ThreadLocker device to connect via. <i>(for more information on Management Sites, please see the ThinScale Management Console Administrators Guide)</i>

## Examples

1. Install ThreadLocker with no interaction with a centrally delivered profile from the Management Server:

```
msiexec /I ThreadLocker.msi CONNECTIONTYPE=0 MGMTURI=https://tstmgmt.domain.local  
MGMTUSERNAME=tlservers MGMPASSWORD=xxxxxxx /QB /L*V "%USERPROFILE%\TK.LOG"
```

2. Auto install ThinKiosk with no interaction, and use a local profile:

```
msiexec /I ThreadLocker.msi CONNECTIONTYPE=2 /QB /L*V "%USERPROFILE%\TK.LOG"
```

## Uninstalling ThreadLocker:

**Note:** The Uninstall must be performed by a user with administrator privileges on the local device.

ThreadLocker is an MSI based installation and will appear in Program and Features within Windows Control Panel.

To uninstall:

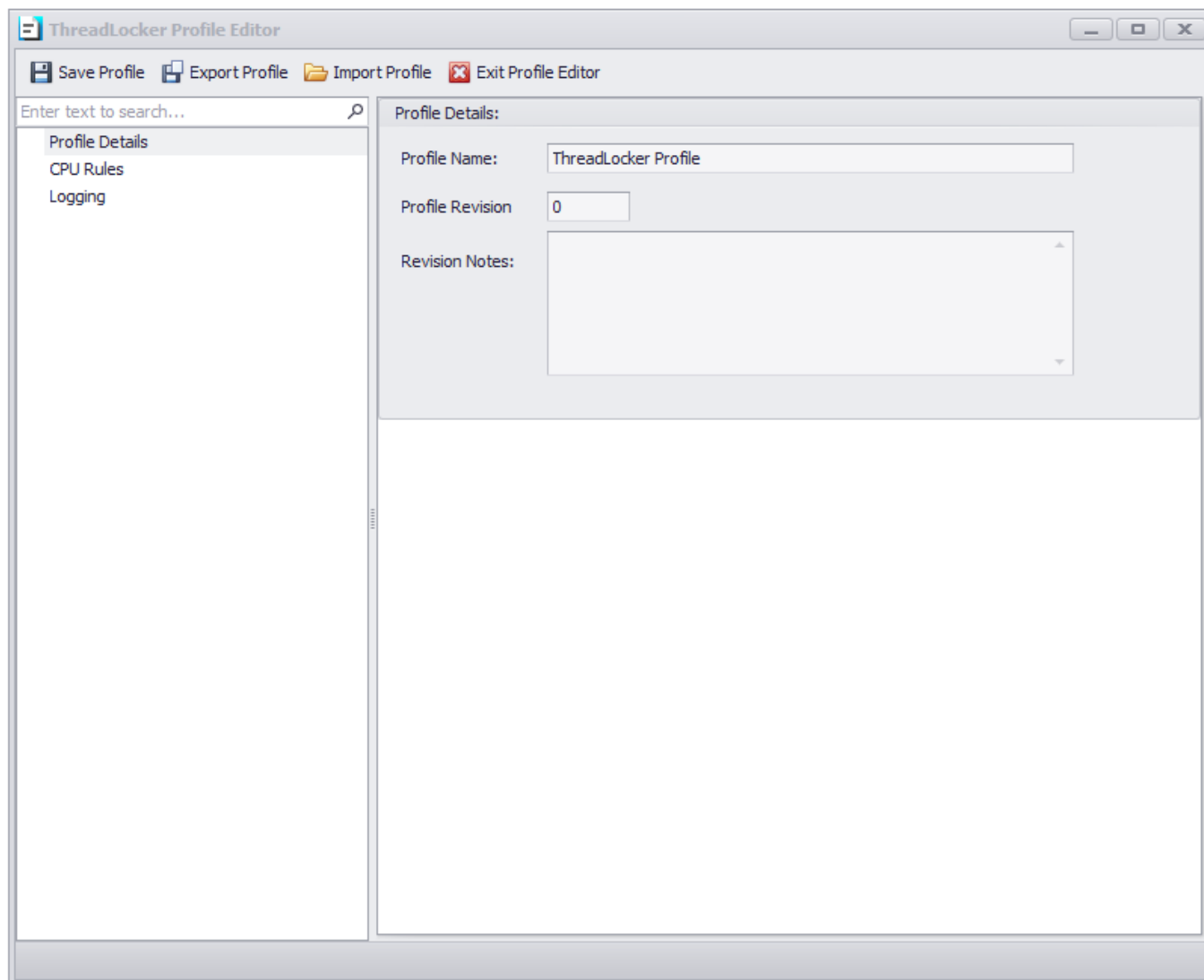
- Open Control Panel
- Select Programs -> Program and Features
- Right click ThreadLocker and select 'Uninstall'
- Follow the uninstall instructions

A reboot will be required once the uninstall has completed.

## ThreadLocker Profile Editor:

The profile editor can be accessed in separate ways depending on the profile delivery method you have opted to:

- ThinScale Management Server - From the ThinScale Management Console, right click your profile and select 'Edit Profile'.
- Local Profile - From the ThreadLocker device select the 'ThreadLocker Profile Editor' from the Start Menu.

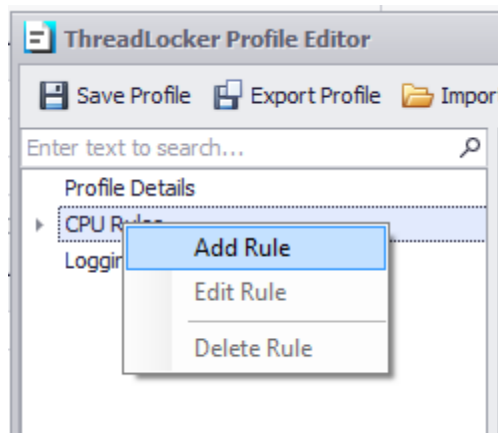


## Configuration Rules:

ThreadLocker's configuration is entirely rule based. You can create a single or multiple rules depending on your ThreadLocking requirements.

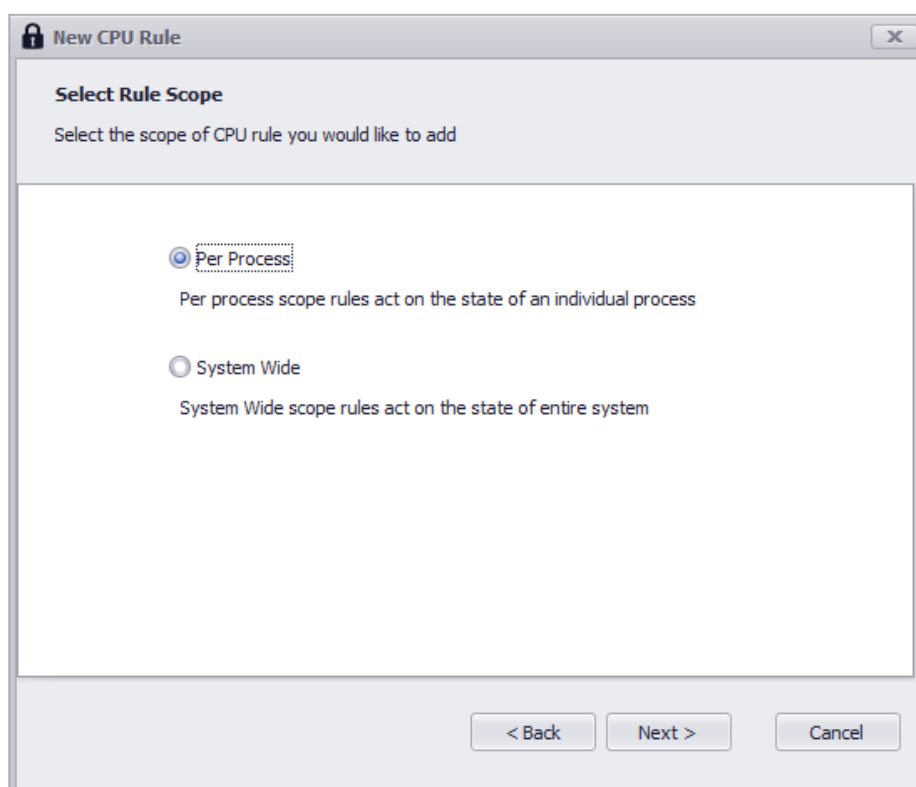
You may have a single rule that covers your requirements or you may need a couple of rules to apply different thresholds to different groups of users for example.

To create a new CPU Rule, right click on the CPU Rules section and select Add Rule.



When creating a rule, you need to select the rule scope, there are two different scenarios:

Rules Scope:



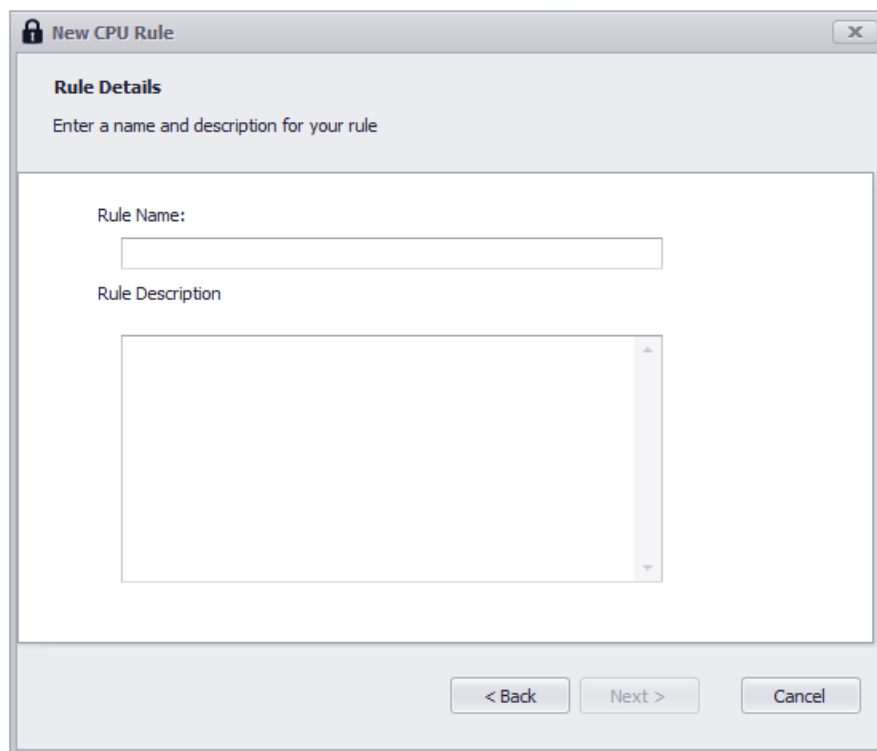
Per Process

The rule applies to the specific processes configured and will apply actions to a process when they exceed the thresholds set.

System Wide

System Wide rules will monitor the CPU Usage of the entire system and when the configured thresholds have been exceeded, ThreadLocker will apply the configured actions to the processes consuming the most resource.

#### Rules Details:



The screenshot shows a dialog box titled "New CPU Rule" with a close button (X) in the top right corner. The dialog has a tab labeled "Rule Details". Below the tab, there is a prompt: "Enter a name and description for your rule". The main area of the dialog contains two input fields: "Rule Name:" followed by a single-line text box, and "Rule Description:" followed by a multi-line text box with a vertical scrollbar. At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel".

#### Rule Name:

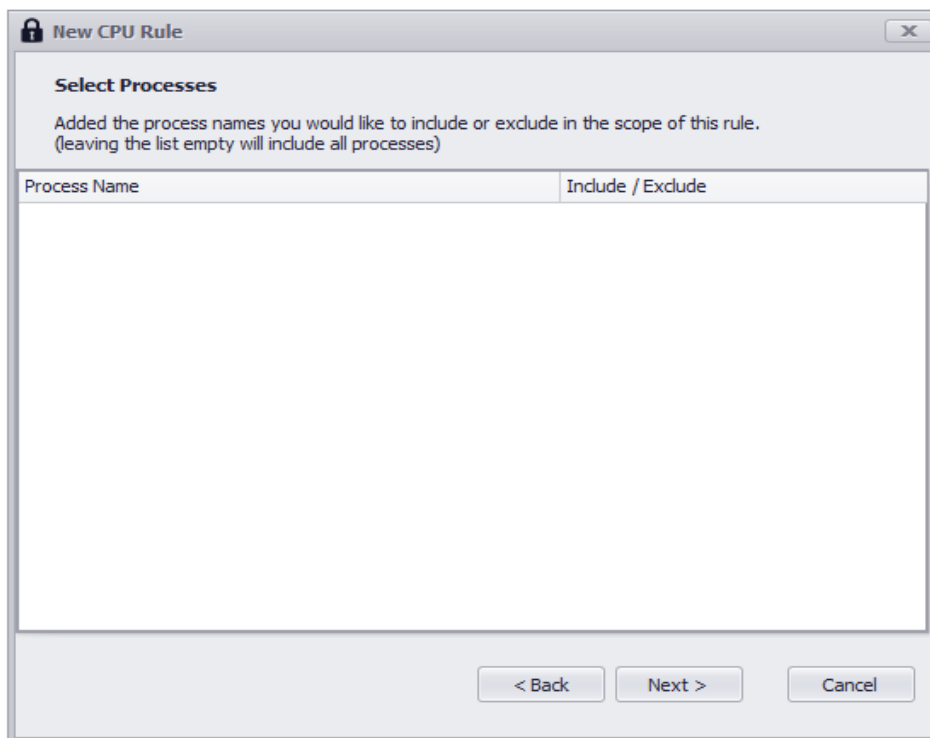
Enter a name for your rule.

#### Rule Description:

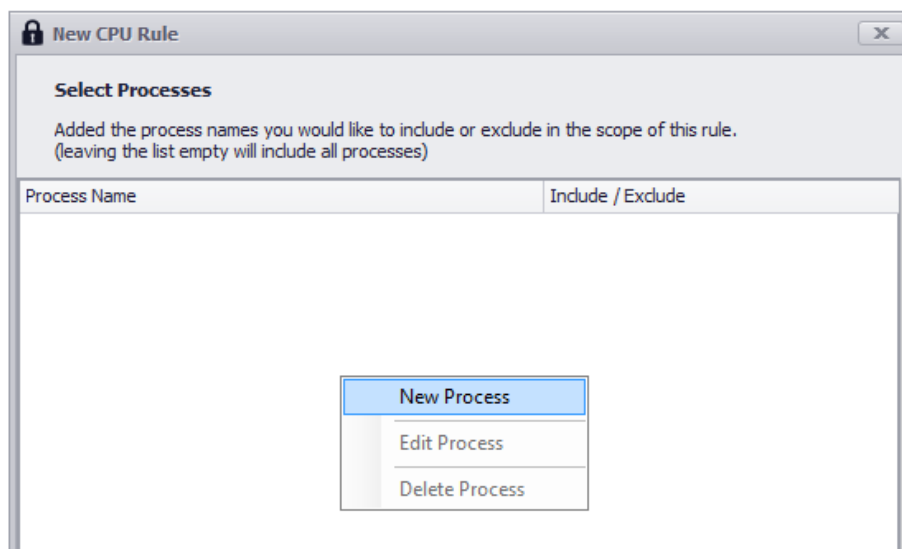
A brief description of the rule.

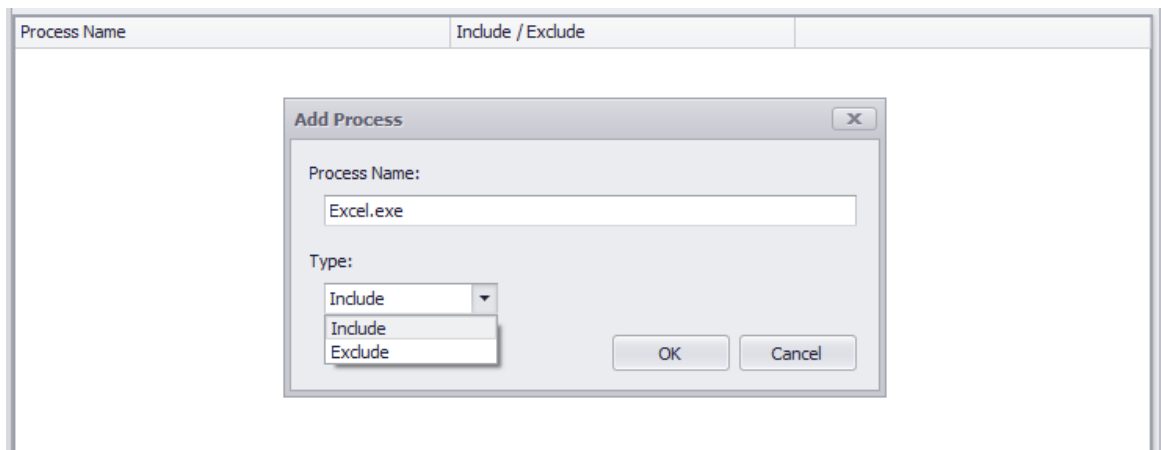
## Select Processes:

This section is used to include or exclude a process from the rule. If you leave the list empty, all processes will be included.

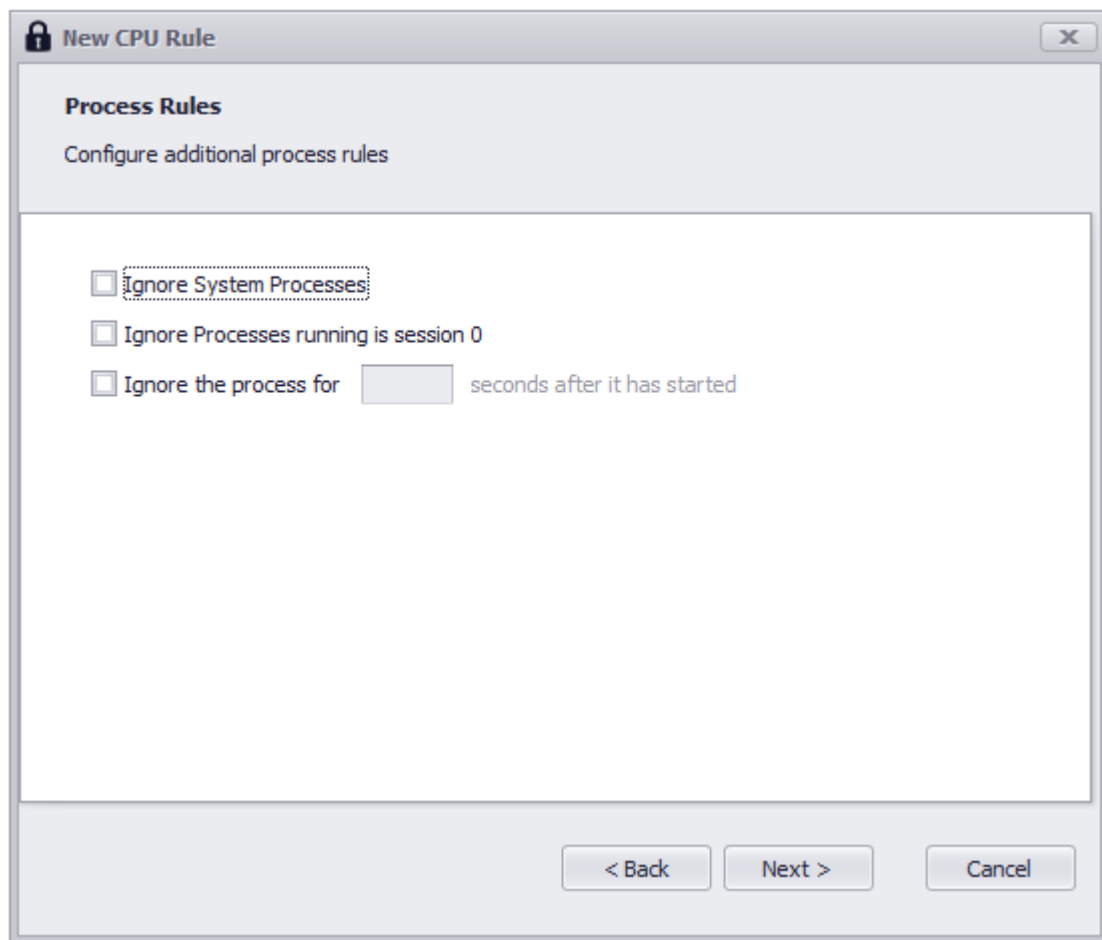


To add a process to the list simply right click and click New Process.





#### Additional Process Rules:



#### Ignore System Processes:

Any processes running under the SYSTEM account will be excluded from the rule. (*Recommended*).

#### Ignore Processes running in Session 0:

Any processes running in session id zero (typically services or processes belonging to the system account) will be excluded from the rule. (*Recommended*).

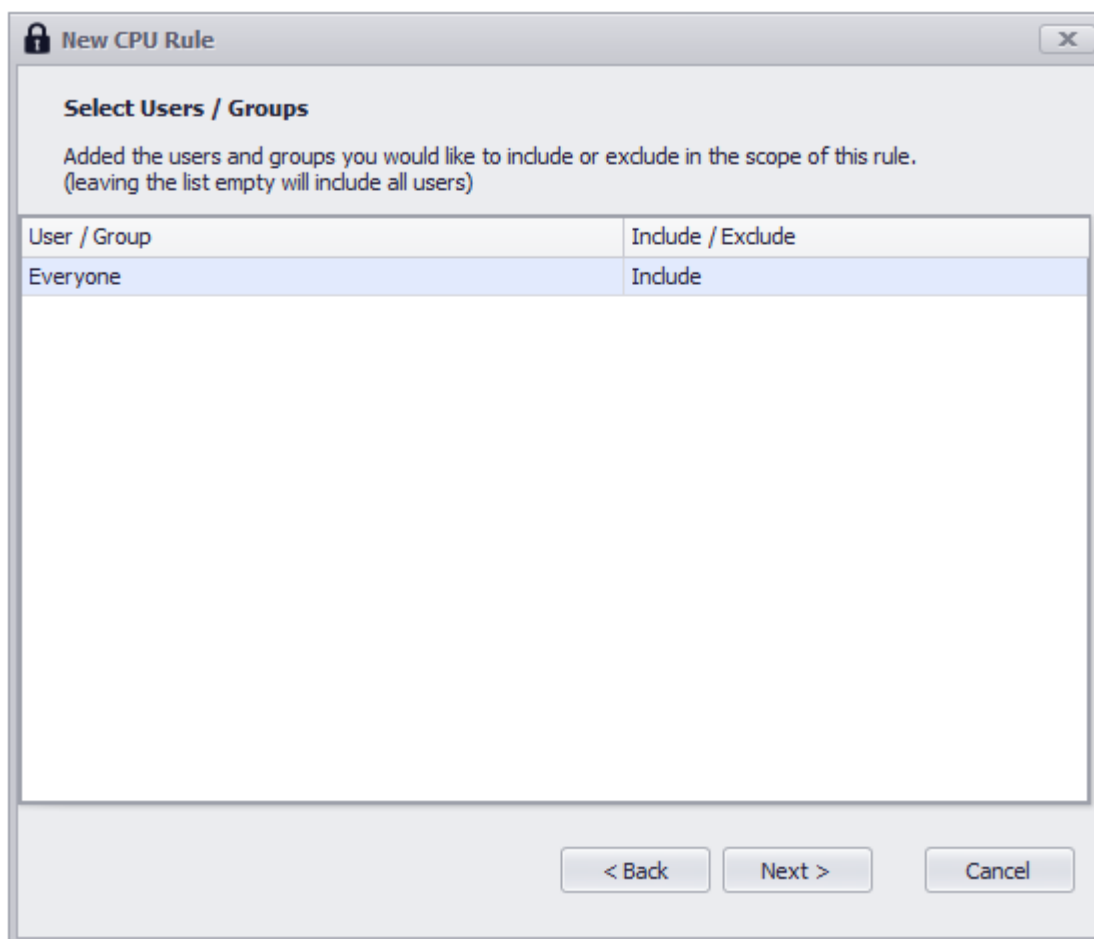


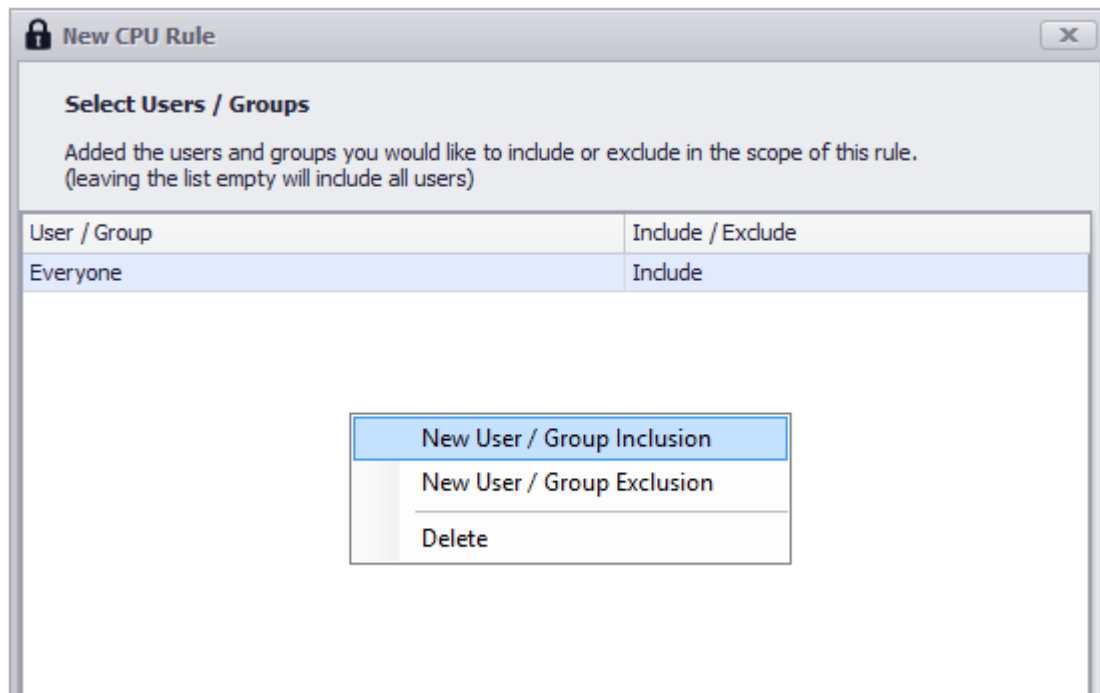
Ignore the Process for:

When this option is enabled ThreadLocker will ignore the process for the specified number of seconds after it has started.

Select Users / Groups:

This section is used to include or exclude users or groups from the rule. If you leave the list empty, all users will be included.





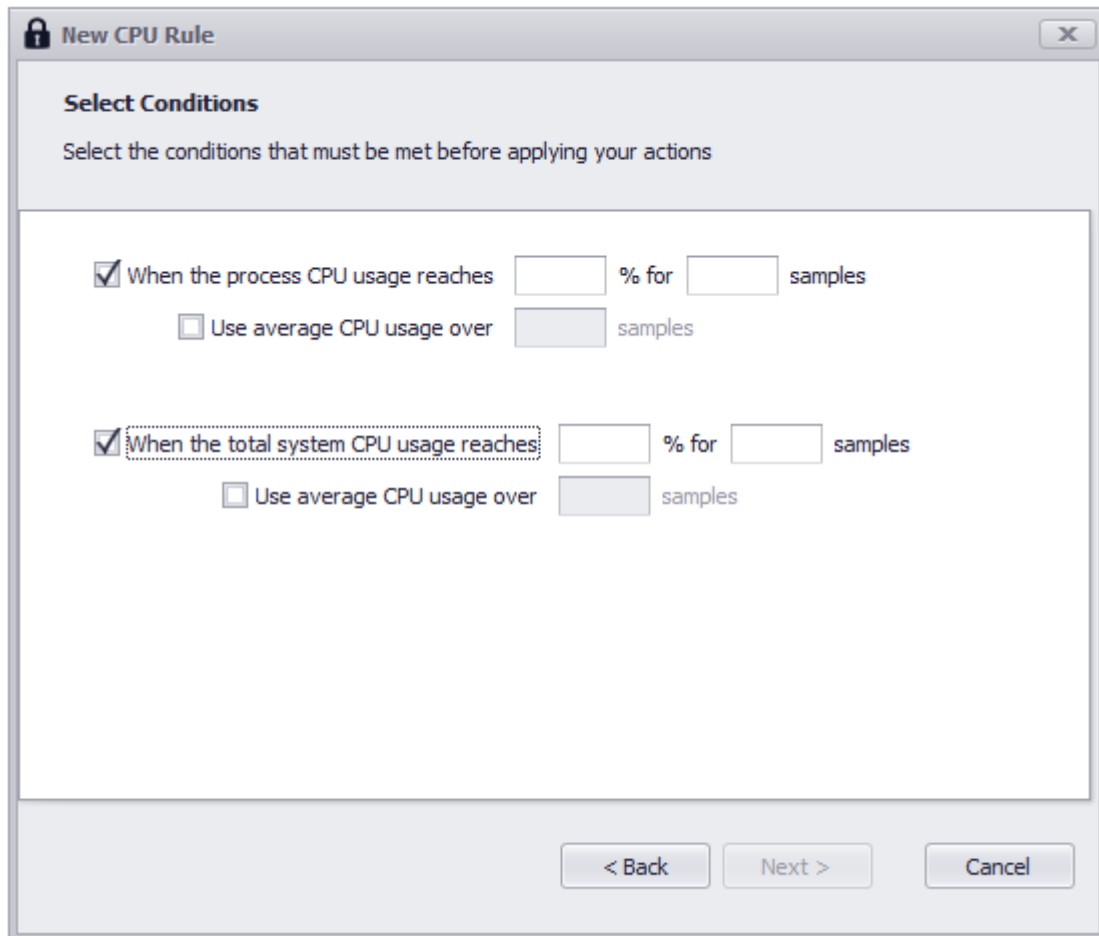
To add a user to the list simply right click and select click New User / Group Inclusion or Exclusion.

## Select Conditions:

Conditions are tests that are performed and must be met before any rule actions are applied to processes in the system.

If you don't enable any conditions then the rule actions will always be applied, this can be useful if you always want to apply an affinity setting to a process regardless of how much CPU it is using.

Conditions are ignored when using a community edition license and therefore actions are always applied to processes.



The screenshot shows a Windows-style dialog box titled "New CPU Rule" with a close button (X) in the top right corner. Below the title bar is a section titled "Select Conditions" with the instruction "Select the conditions that must be met before applying your actions". The main area contains two sets of options. The first set has a checked checkbox "When the process CPU usage reaches" followed by a text input field, "% for", another text input field, and the word "samples". Below this is an unchecked checkbox "Use average CPU usage over" followed by a text input field and the word "samples". The second set has a checked checkbox "When the total system CPU usage reaches" followed by a text input field, "% for", another text input field, and the word "samples". Below this is an unchecked checkbox "Use average CPU usage over" followed by a text input field and the word "samples". At the bottom of the dialog are three buttons: "< Back", "Next >", and "Cancel".

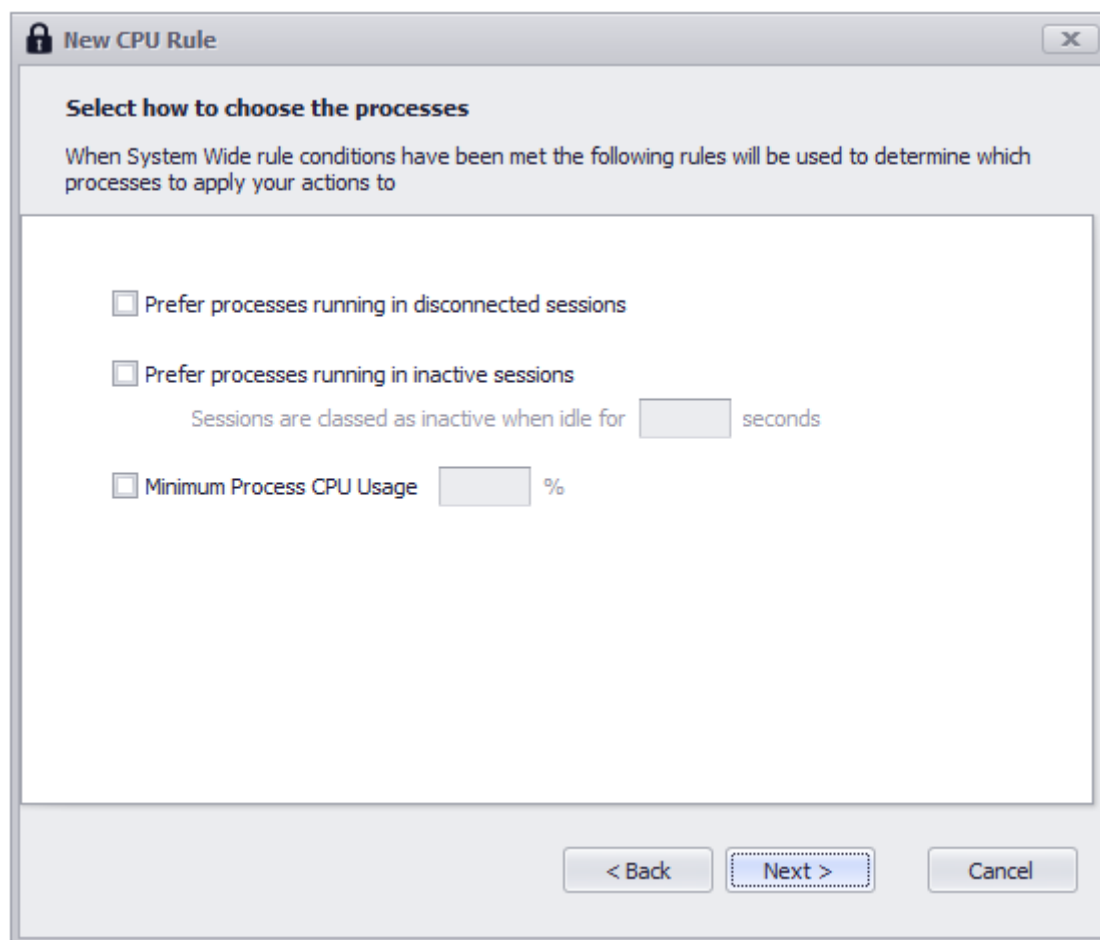
There are two conditions that can be checked:

- When the process CPU usage reaches a certain percentage for the number of samples, you specified. *(this condition is only available for Per Process rules)*
- When the total system CPU usage reaches a certain percentage for the number of samples, you specified.

Additionally, you can use an average CPU calculation, where system CPU usage and process CPU usage are calculated using averages of their recent consumption.

Select how to choose the processes:

(These options are only available for System Wide rules)



The screenshot shows a Windows-style dialog box titled "New CPU Rule" with a close button (X) in the top right corner. The main heading is "Select how to choose the processes". Below this, a descriptive text states: "When System Wide rule conditions have been met the following rules will be used to determine which processes to apply your actions to". The dialog contains three checkbox options, each with an associated input field:

- ☐ Prefer processes running in disconnected sessions
- ☐ Prefer processes running in inactive sessions  
Sessions are classed as inactive when idle for  seconds
- ☐ Minimum Process CPU Usage  %

At the bottom of the dialog, there are three buttons: "< Back", "Next >" (which is highlighted with a dashed border), and "Cancel".

Prefer processes running in disconnected sessions:

If enabled, processes running in disconnected sessions will be selected before active sessions

Prefer processes running in active sessions:

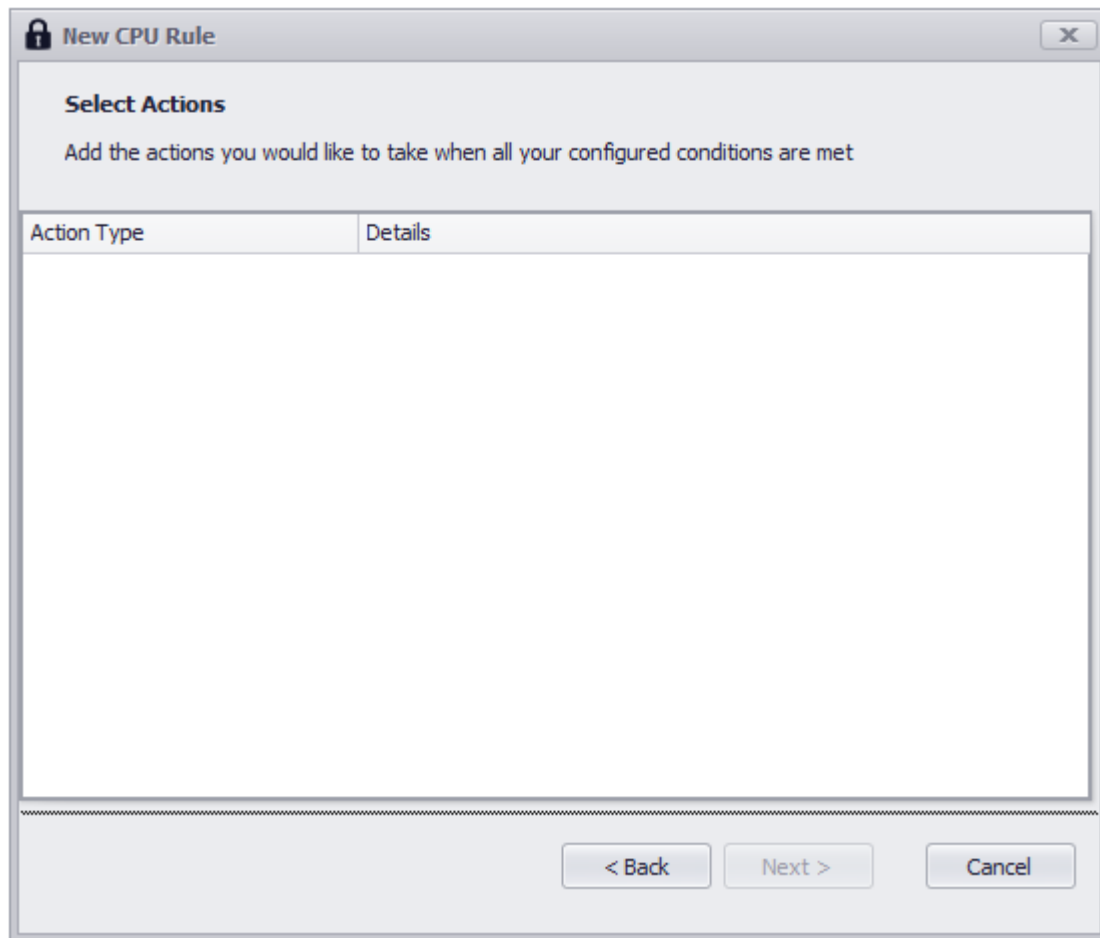
If enabled, processes running in sessions that are idle will be selected before active sessions.

Minimum Process CPU Usage

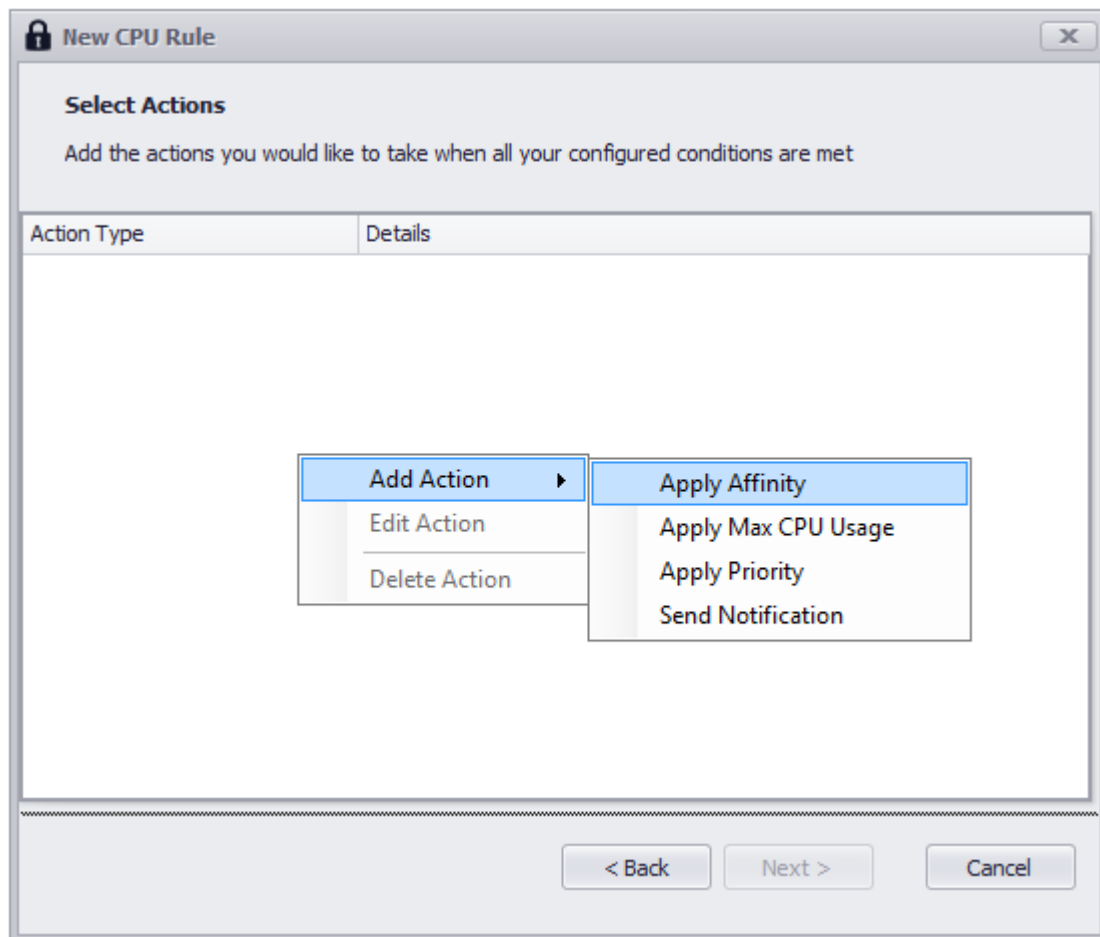
If enabled, a process will only be selected if it is consuming at least the configured amount of CPU.

## Select Actions:

This section is used to create actions that ThreadLocker will apply when the enabled conditions have been met.



To create an action just right click and click Add Action.



ThreadLocker has four actions types:

- Apply Affinity
- Apply Max CPU Usage
- Apply Priority
- Send Notification

## Apply Affinity:

Apply Affinity sets a processes affinity so it will only be scheduled to run on the CPU cores specified.

**Note:** if you select a core that is not present in the target system, the action will not be applied. When creating an affinity action ensure you know how many cores are in the target system.

**New CPU Rule**

**Select Actions**

Add the actions you would like to take when all your configured conditions are met

Action Type	Details
<b>Assign Affinity Action</b>	
Select the CPU's you want this action to apply your processes affinity to	
<input checked="" type="checkbox"/> CPU 0	<input type="checkbox"/> CPU 1
<input type="checkbox"/> CPU 2	<input type="checkbox"/> CPU 3
<input type="checkbox"/> CPU 4	<input type="checkbox"/> CPU 5
<input type="checkbox"/> CPU 6	<input type="checkbox"/> CPU 7
<input type="checkbox"/> CPU 8	<input type="checkbox"/> CPU 9
<input type="checkbox"/> CPU 10	<input type="checkbox"/> CPU 11
<input type="checkbox"/> CPU 12	<input type="checkbox"/> CPU 13
<input type="checkbox"/> CPU 14	<input type="checkbox"/> CPU 15
<input type="checkbox"/> CPU 16	<input type="checkbox"/> CPU 17
<input type="checkbox"/> CPU 18	<input type="checkbox"/> CPU 19
<input type="checkbox"/> CPU 20	<input type="checkbox"/> CPU 21
<input type="checkbox"/> CPU 22	<input type="checkbox"/> CPU 23
<input type="checkbox"/> CPU 24	<input type="checkbox"/> CPU 25
<input type="checkbox"/> CPU 26	<input type="checkbox"/> CPU 27
<input type="checkbox"/> CPU 28	<input type="checkbox"/> CPU 29
<input type="checkbox"/> CPU 30	<input type="checkbox"/> CPU 31

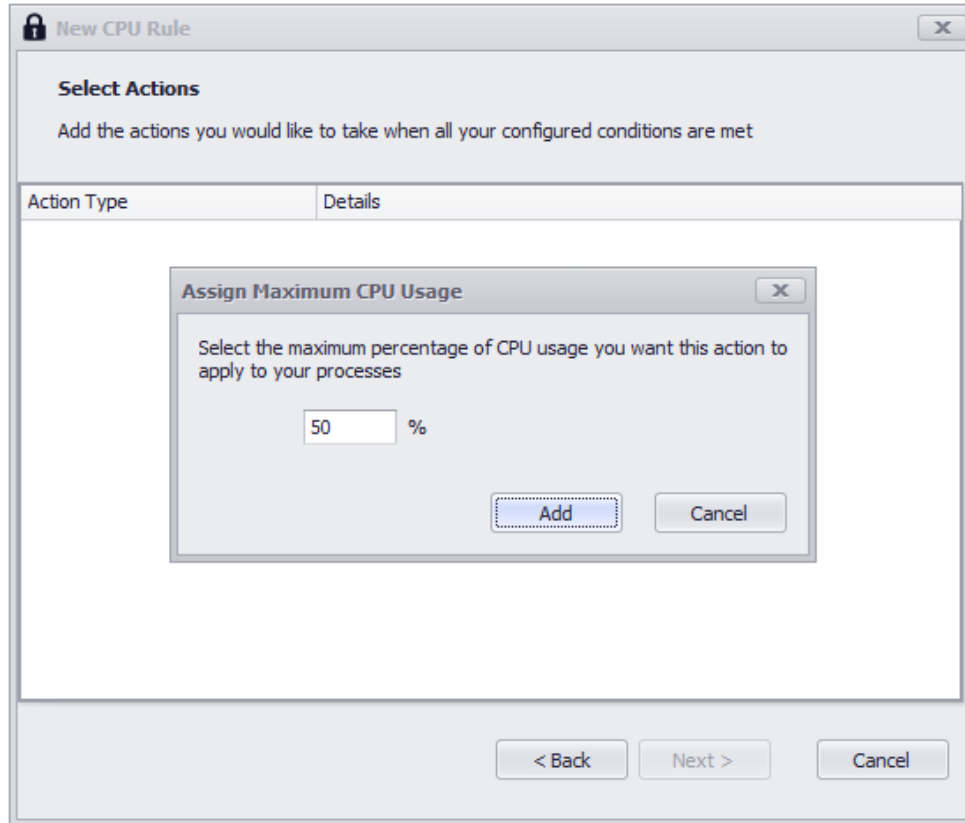
Add Cancel

< Back Next > Cancel

## Apply Max CPU Usage

This action will apply a limit to amount of CPU a process can consume at any given time.

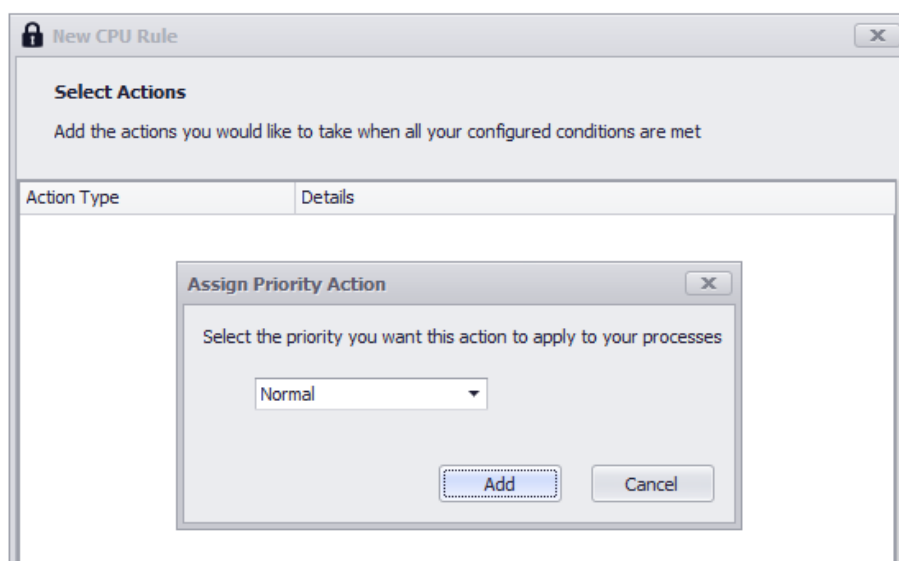
When used in combination with the affinity action, the process usage calculation is based on the percentage of every core in the system not the cores the affinity action rule has applied.





## Apply Priority

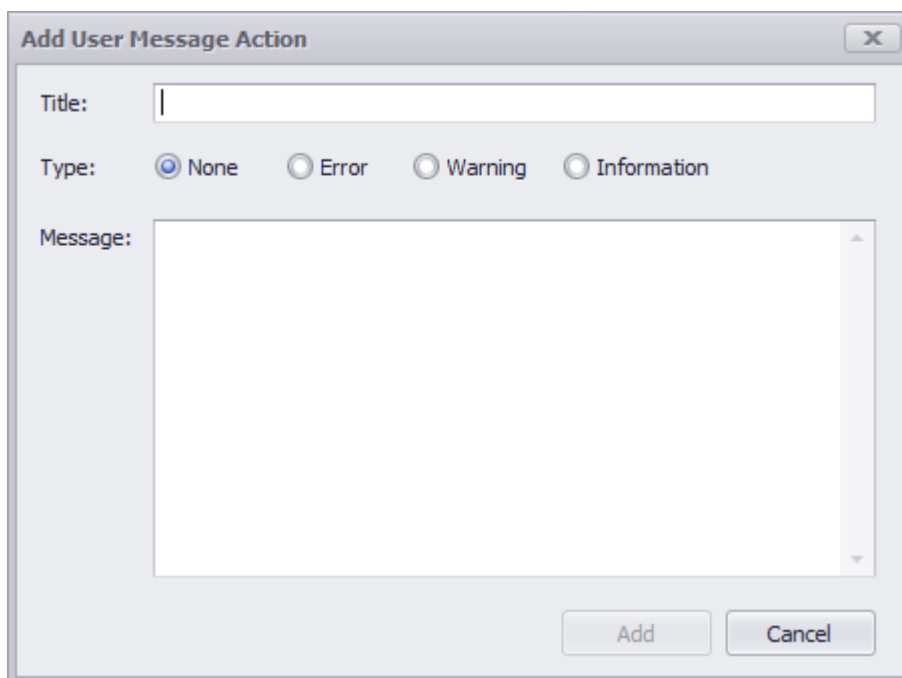
This action will apply the selected process priority.



## Send Notification

Send Notification will display a system tray notification message to the user who is running the process that has met all the conditions.

The message can be fully customized and different icon styles applied.

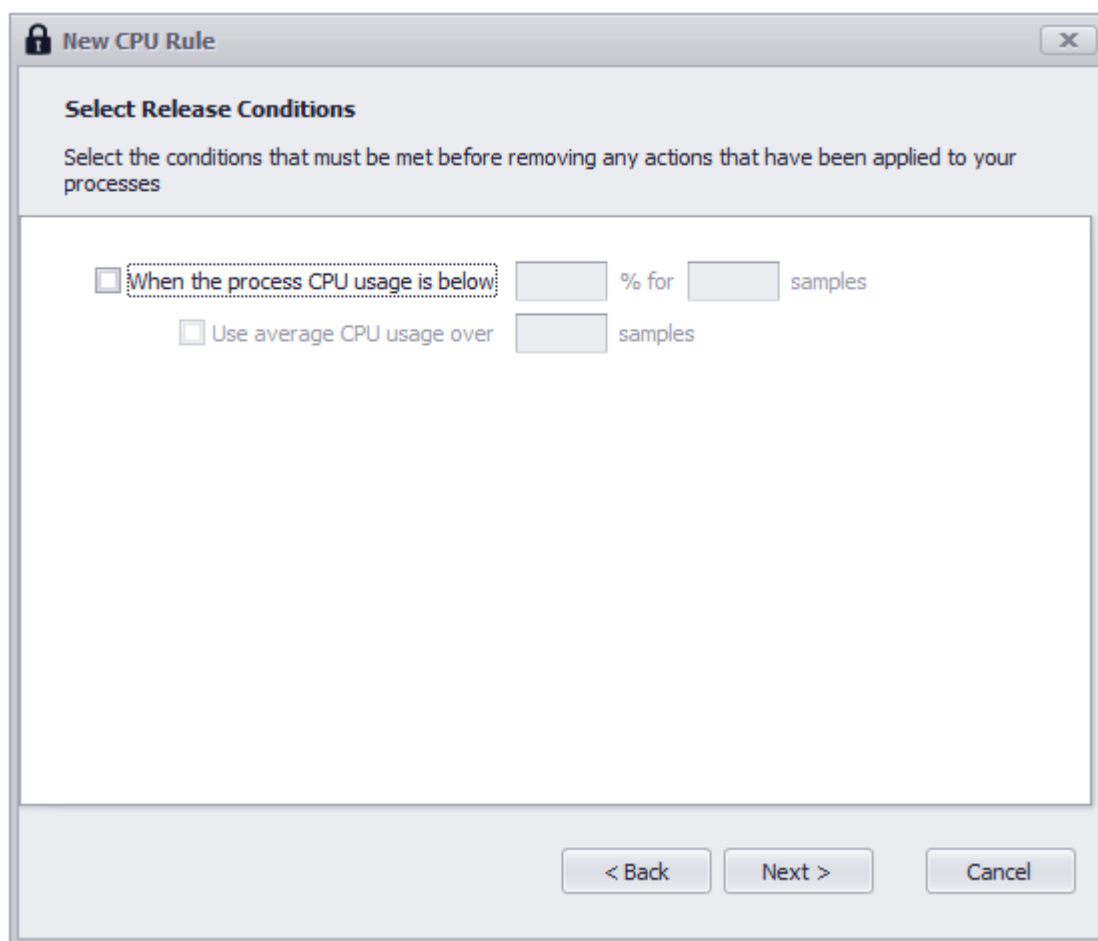


The image shows a dialog box titled "Add User Message Action". It contains a "Title:" label followed by a text input field. Below this is a "Type:" label followed by four radio button options: "None" (selected), "Error", "Warning", and "Information". At the bottom is a "Message:" label followed by a large text area with a vertical scrollbar. In the bottom right corner, there are two buttons: "Add" and "Cancel".

## Select Release Conditions:

Release conditions are used to determine when to remove the actions that have been applied to a process. If no release conditions are enabled the process will never have any applied actions removed.

Release conditions are only available for Per Process rules.



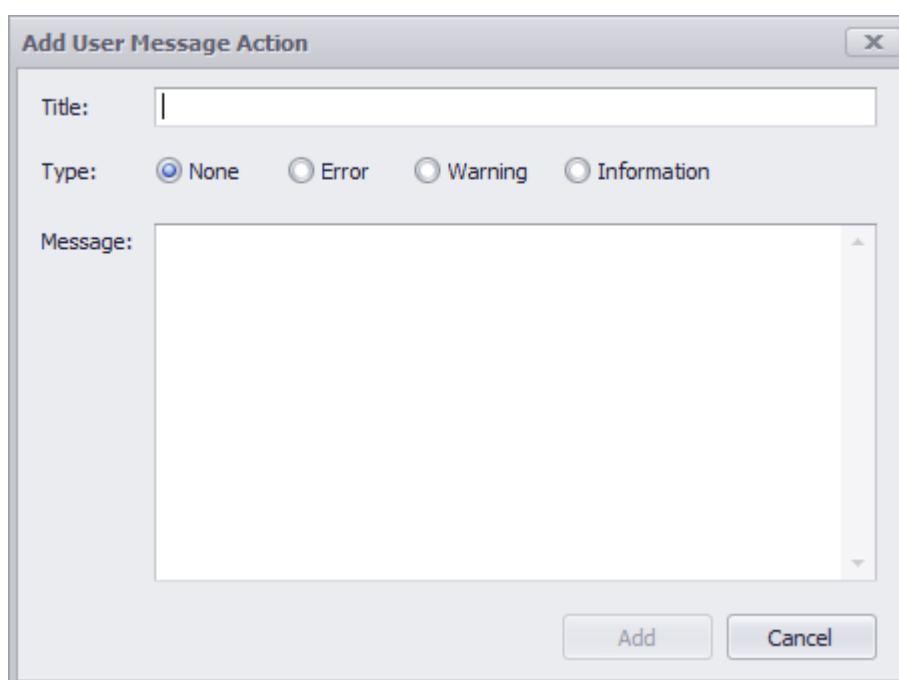
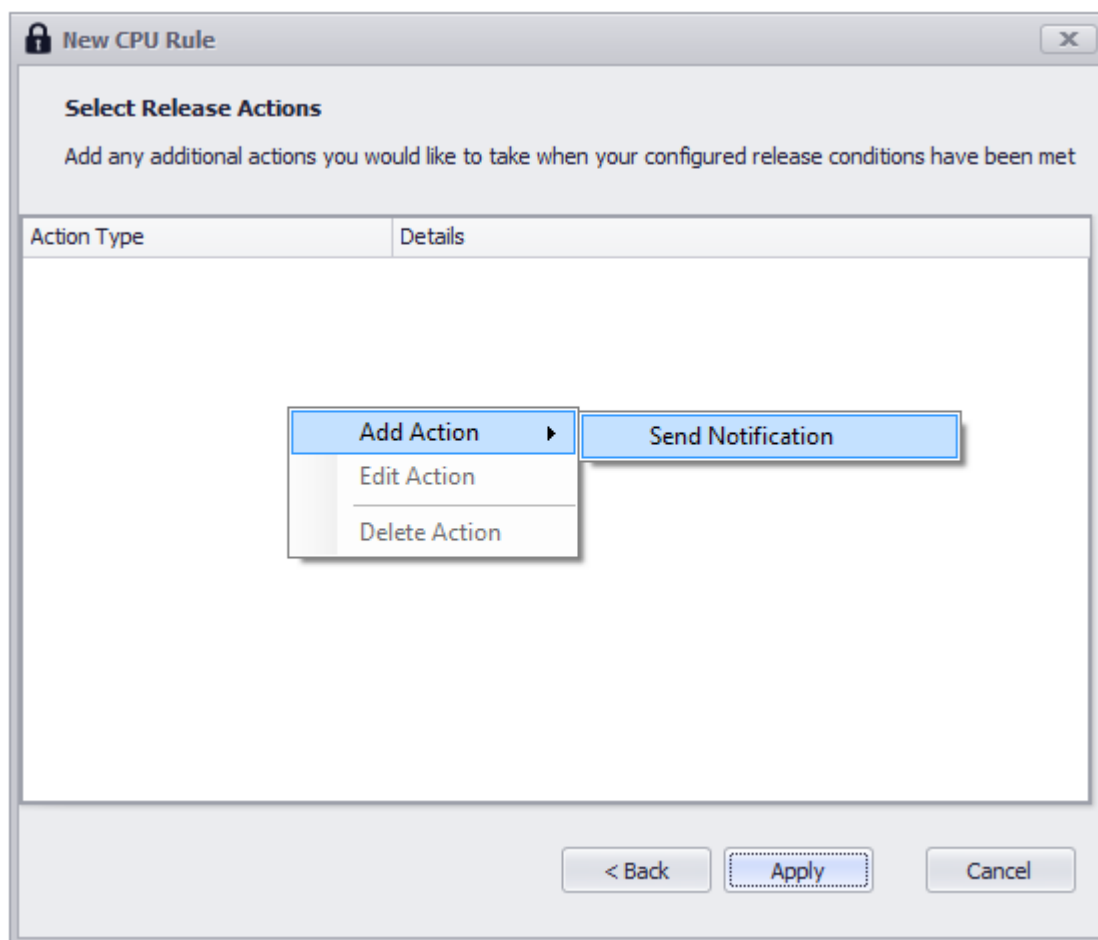
The screenshot shows a dialog box titled "New CPU Rule" with a close button (X) in the top right corner. Inside the dialog, there is a section titled "Select Release Conditions" with the instruction "Select the conditions that must be met before removing any actions that have been applied to your processes". Below this, there are two checkboxes. The first checkbox is labeled "When the process CPU usage is below:" and is currently selected. To its right are two input fields: the first is empty, followed by "% for", and the second is empty, followed by "samples". The second checkbox is labeled "Use average CPU usage over" and is currently unselected. To its right is one input field, followed by "samples". At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel".

- When the process CPU usage reaches a certain percentage for the number of samples, you specified.

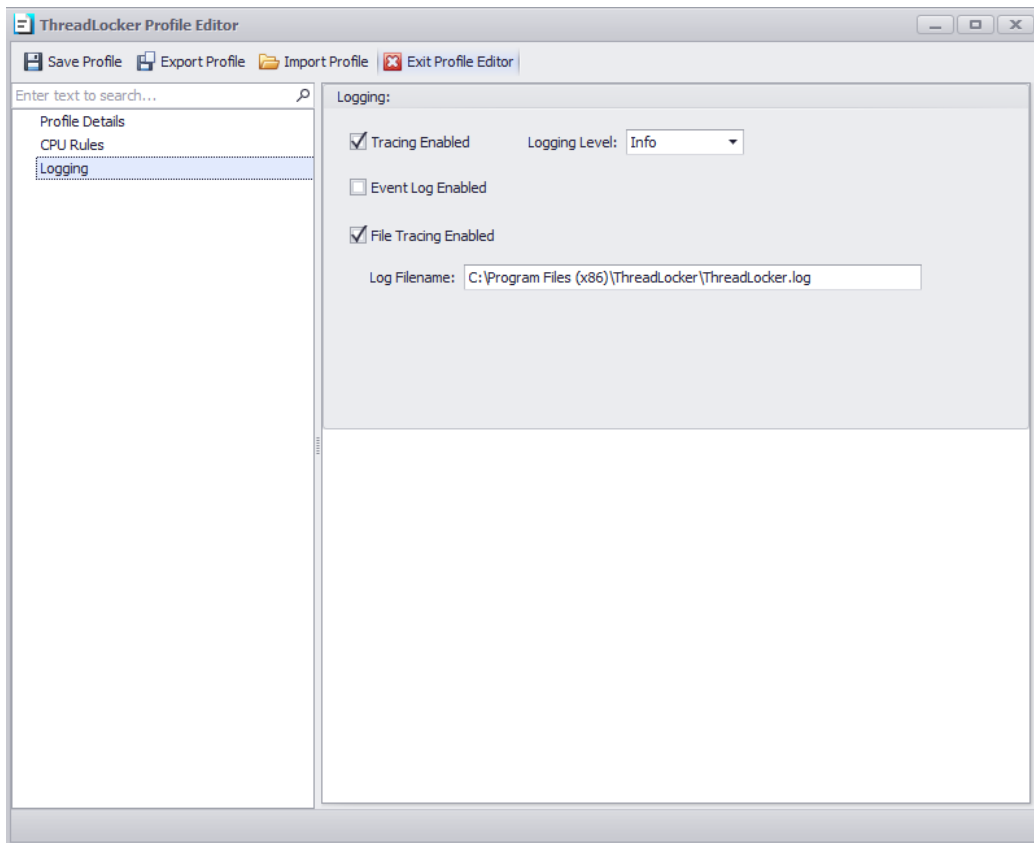
Additionally, you can use an average CPU calculation, where process CPU usage is calculated using averages of its recent consumption.

## Select Release Action

When a rule's release conditions have been met and processes have had their actions removed, you can optionally send a notification to the user.



## Logging:



## Logging Levels:

There are several levels of logging possible with ThreadLocker from diagnostic info to hard errors:

- Notifications
- Info
- Warning
- Error
- Fatal Error

**Note:** The “Info” logging level should only be used for troubleshooting and due to its verbosity, cannot be saved to the event logs.

## Event Log Levels:

If enabled, the events coming from ThreadLocker will be saved within Windows Event Viewer logs.

## File Tracing Enabled:

If enabled, the events coming from ThreadLocker will be saved into a file within your desired folder.

## Licensing

During installation, ThreadLocker will install a 30-day Enterprise Edition trial license. During this time ThreadLocker will have all the functionalities required for you to test the application.

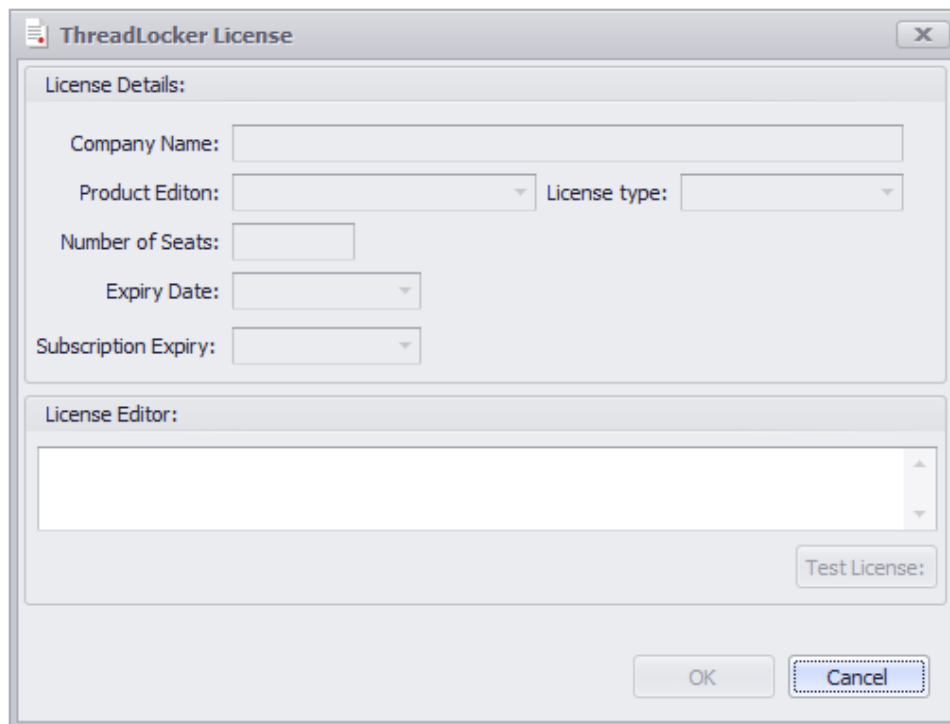
### Receiving a license:

Reach out to our sales team on [sales@thinscaletechnology.com](mailto:sales@thinscaletechnology.com) and mention you would like a quote for ThreadLocker.

### Installing a license on a standalone ThreadLocker:

Once you have received your license:

- Paste in your key into the license editor ensuring all text is without carriage returns or blank spaces and click 'Test License.'
- The License Details tab should update with the company information provided.

The image shows a screenshot of a software window titled "ThreadLocker License". The window is divided into two main sections. The top section, labeled "License Details:", contains several input fields: "Company Name:" (a text box), "Product Edition:" (a dropdown menu), "License type:" (a dropdown menu), "Number of Seats:" (a text box), "Expiry Date:" (a date picker), and "Subscription Expiry:" (a date picker). The bottom section, labeled "License Editor:", contains a large text area for pasting a license key. To the right of the text area is a button labeled "Test License:". At the bottom right of the window are two buttons: "OK" and "Cancel".

### Installing a license on a ThreadLocker connected to the Management Console:

Please refer to the ThinScale Management Console Guide on how to install a license.

For any queries in relation to ThinScale products feel free to contact us at

[support@thinscaletechnology.com](mailto:support@thinscaletechnology.com)