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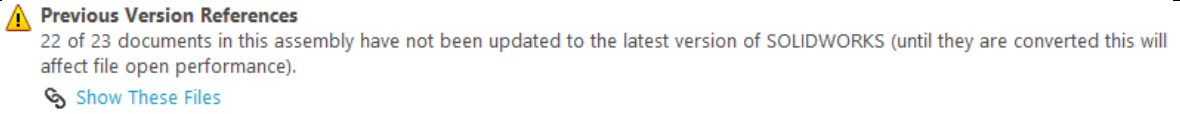
LARGE ASSEMBLY TIPS: DETAILS

Clarifications and details for Large Assembly tips: checklist

General

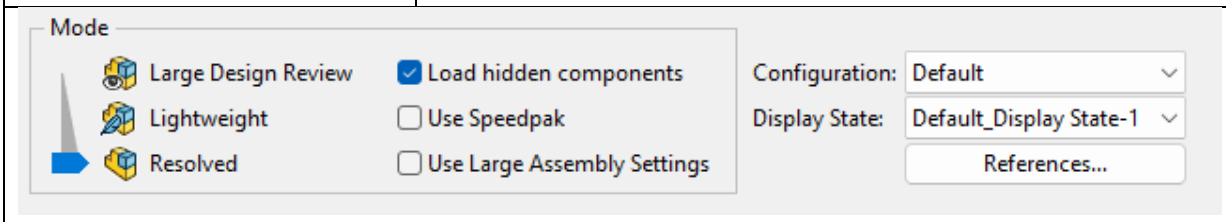
Solidworks version	Use the **latest version of Solidworks**. New releases usually include significant performance improvements.
	Along with using the latest version of Solidworks, the **files should also be converted to the latest version**. Using Performance Evaluation will show the files' version status. They can be converted using: - Save in Solidworks - Task Scheduler - File Version Upgrade Utility (for PDM)



Mates och Assembly structure	Mates can have a direct impact on rebuild time. Below are some recommendations to reduce it: - **Decrease the number** of mates on the top-level and **use sub-assemblies**. - Use **flexible sub-assemblies** to test a function, switch it back to **rigid** when done. - **Favour standard mates** (if possible) over advanced and mechanical mates. - If applicable, **remove all mate errors**.

Open

Open… 	By using **Open…** in Solidworks (instead of e.g. double clicking the file) different settings can be selected to make the assembly easier to handle already when opening the file. Which settings to use depend on among others the workflow and editing capabilities the user wants to access.



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Large Design Review	This setting applies when the user only needs to **visualise** the assembly with limited editing capabilities. The assembly is quickly opened, and the following tools can be accessed (among others): - Selective open - Measure - Hide/Show - Insert components - Delete components - Create, edit & delete mates - Create & edit component patterns
Lightweight	The assembly opens faster than Resolved by loading only a subset of the data. With this option selected, most tools available in Resolved are accessible with limitations. It cannot be used for Routing assemblies and Flexible assemblies. Lightweight **should be avoided if the assembly is to be troubleshot** since there are no tree warning indicators. Each erroneous component needs to be found manually and set to Resolved for solving the issue. N.B.: Lightweight assemblies cannot be loaded in Composer.
Resolved	With Resolved setting selected, all tools are available, and components can be modified faster than when using Lightweight. On the other hand, it **can prolong the opening/loading time** and **worsen the performance**. Performance can be slightly improved by activating **Large Assembly settings** as well. These settings can be activated/deactivated in Tools > System Options > Assemblies.
Optimized Resolved Mode (2023)	The option "**Optimized Resolved mode**" is the **best compromise** between Lightweight and Resolve. It provides quicker file opening from Lightweight setting as well as troubleshooting capabilities from Resolved setting.
Load hidden components	If hidden components in an assembly do not need to be edited, **deactivating** this option will improve the opening time. Combining **Hide/Show and Select Components by Size** can be an efficient method to improve the performance.
Use Speedpak	With this option, sub-parts' and sub-assemblies' Speedpak can be already activated when opening the top-level assembly. This **only impacts** performance **if Speedpak configurations have been created beforehand** for the sub-components.
Configuration / Display State	If simplified configurations and/or display states were created beforehand, these settings can be activated to improve performance when opening the file. By selecting **<Advanced>** in the configuration list, **all components can be opened with a preselected configuration**. Using this method with consistent configuration naming (e.g. "Simplified" for all components) can be really effective.

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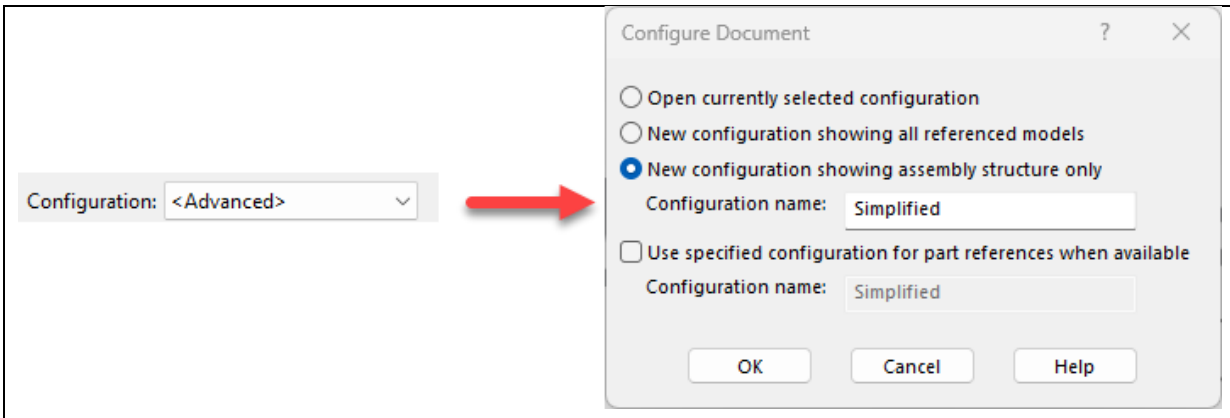
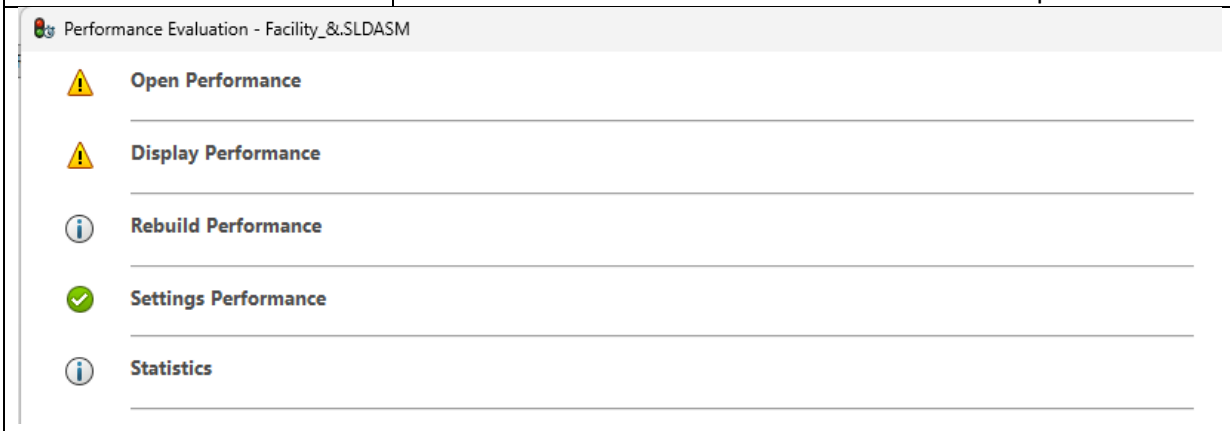


Evaluate

Performance Evaluation	Performance Evaluation (in the Evaluate tab) sums up properties that impact the assembly's **performance**. This tool provides among others information about: - The heaviest components to open and render (number of triangles) - Warning on file version - Rebuild performance and circular references - Large assembly settings - Useful statistics such as total number of components



Assembly Visualization	Assembly visualisation is a useful tool to sort out components by diverse properties. When it comes to the performance a column **with Total Graphics Triangles** can be added to visualize and sort components by the number of triangles to be rendered. It is a powerful method to identify/isolate the heaviest components and if applicable simplify or suppress them.

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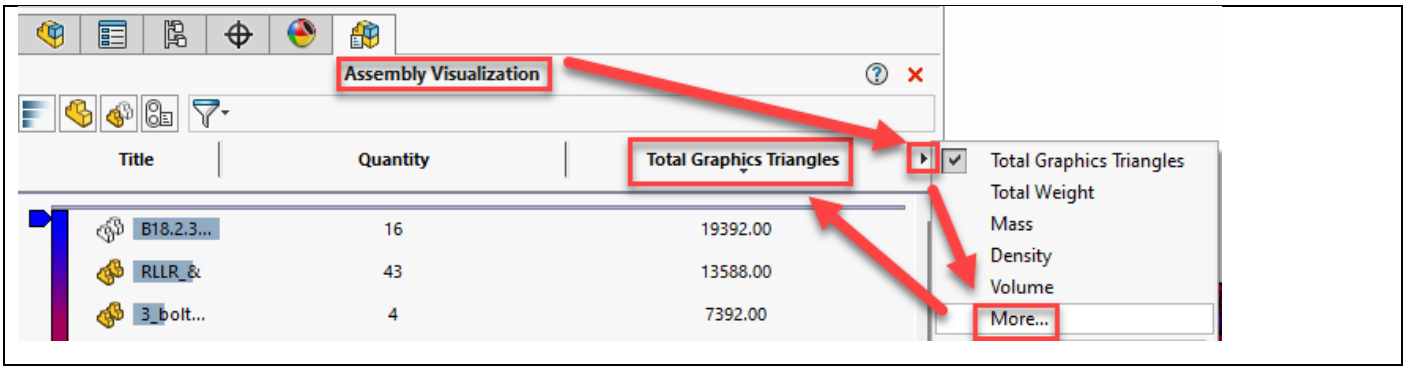

Simplify

Configurations v/s Display States	Configurations are used to create several versions of the same product (suppress, size, placement). Display State is the equivalent function when it comes to visual properties only (colour, transparency, hide/show). If possible, **display states should be favoured over configurations** since it does not require any rebuild (each switch between different configurations causes a rebuild). Note that **both can be used in Drawings**.
Display State	
Select Components by Size **Hide/Show**	To visually simplify the model, display states with hidden components can be created. An efficient method is to select all components with a certain size by using Select Components by Size (e.g. small components). Once selected they can be hidden with Hide/Show.
Configuration *N.B.: When configurations are used to simplify a model, it should be done on the **part level**. These configurations should have a **consistent naming** (.e.g. "Simplified"). See also Open, Configuration, <Advanced>.*	
Defeature	A model's geometry can be simplified quickly using defeature tool. The optimized model can be saved e.g. as a new configuration. This tool should be used among others for **imported models** with **complex geometry** and **irrelevant details**.
Speedpak	Using Speedbak can improve the performance by making the **non-functional details only rendered**. The functional entities used for e.g. mates can be preserved during the Speedpak creation.

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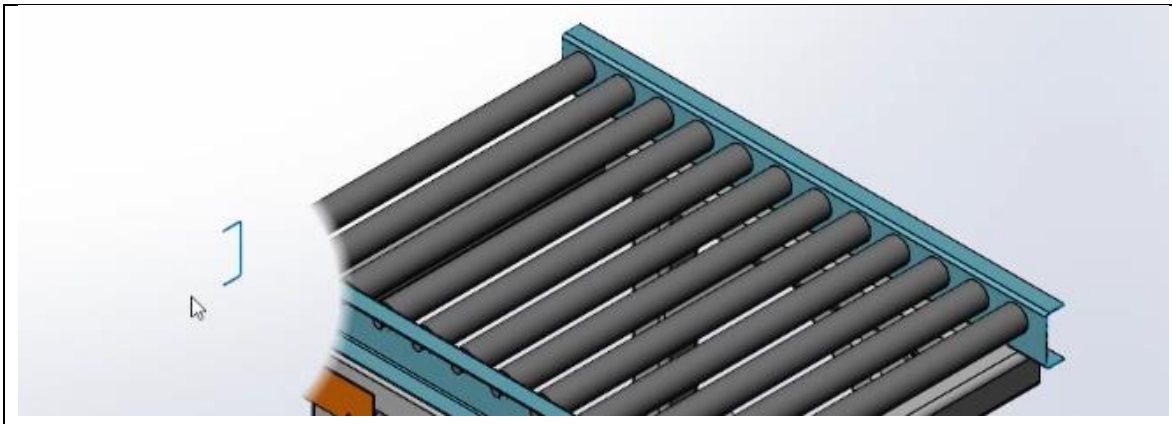

Sub-assemblies / Save As Part	
Save As Part	For better performance, sub-assemblies can be saved as parts if its sub-parts are not relevant for the top-level assembly. There are however some **limits** to keep in mind with this method: - The bodies get loaded in the memory which still uses system resources - Separate bodies get created if there are component patterns - Advanced show/hide and display states are lost - Silhouette defeature tool cannot be used on parts

Drawings

Creating a drawing of a complex assembly can also be time consuming. While simplifying the assembly itself usually solves problems with a slow drawing, additional properties can also impact the performance.

Number of faces/edges	Their number should be kept **as low as possible**. When applicable, it is better to create **several documents** instead of having several views in the same drawing.
Number of views	
Number of configurations	
Section/Crop Views	These views can be **extremely demanding** in terms of system resources since each cut calculates the exact HLR, adds hatching and hides the other bodies.
Detailing Mode	Detailing mode can be used to **quickly open a drawing** with limited editing capabilities.
Hide views	To improve the performance, the user can work with **one view at a time** and **hide the others**.
Automatic view update	Automatic view update can be deactivated, and the update deferred to later.

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