HyperWorks® Enterprise

Results Visualization

Beta

User and Administration Guide

Version 0.9

What's Inside

- How to install the Results Visualization service
- Overview of Results Visualization Service and supported functionalities
- Steps for performing common administration and results visualization tasks

System Requirements

Server Platforms

- Only 64-bit platforms are supported
- Windows Server 2008, 2008 R2, Red Hat Enterprise Linux 5.x, SUSE 10 and SUSE 11
- A minimum of 4GB RAM and a dual core (2 CPU) processor

Web Browsers supported

- Mozilla Firefox 4 or higher
- Google Chrome 10 or higher
- Safari 5 or higher

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1. Introduction

The HyperWorks® Enterprise Results Visualization service helps users to generate, visualize, and store CAE results information through the HyperWorks® Enterprise Compute Manager User Interface. It can be used to generate plots and animation information from the results files generated by various solvers. (*Refer supported Results types section*)

Note: The service in Beta and is intended for **beta testing only**. It should not be used in a production environment.

2. Overview of the guide

This guide is primarily for the novice and intermediate users. It provides step-by-step guidance in installing the service as well as executing the results visualization tasks in the application.

3. Installing Altair HyperWorks 11.0 Product Suite

Download the **Altair HyperWorks** product from the user area of Compute Manager product and install it. For more information, please contact your local administrator or contact Altair support.

4. Installing the service

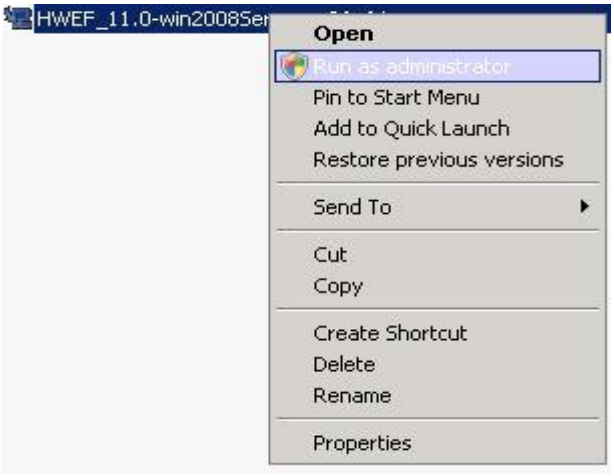
4.1 Pre-requisites

1. PBS and PBS Professional Application services should be installed.
2. Hyperworks-11.0 should be installed.
3. A “Root” or an “Admin” user depending on the OS should do the installation.

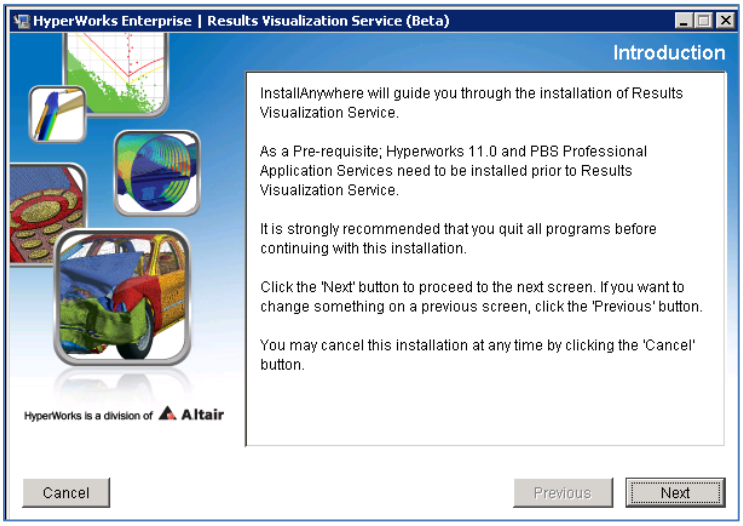
Note: HyperWorks® Enterprise Compute Manager should be installed and configured **after** the Results Visualization service installation for viewing the results.

4.2 Steps

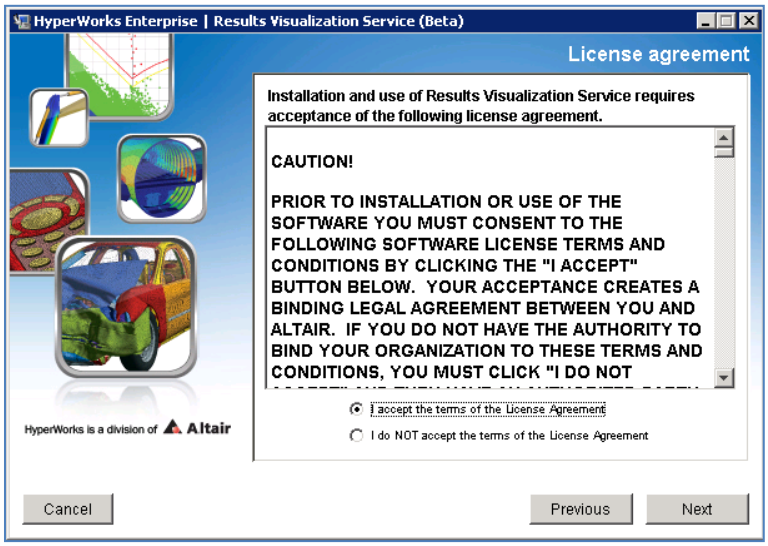
1. Right click on the installer and select ‘Run as administrator’



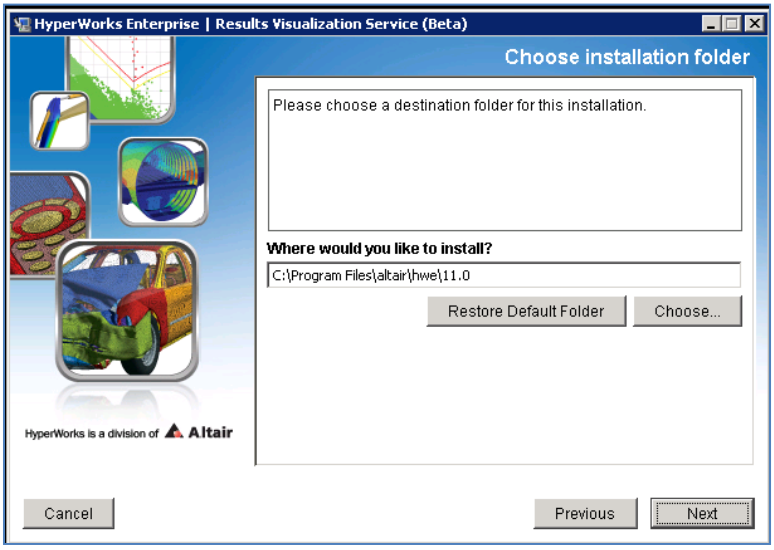
2. The introduction screen displays the pre-requisites for the service to be functional.



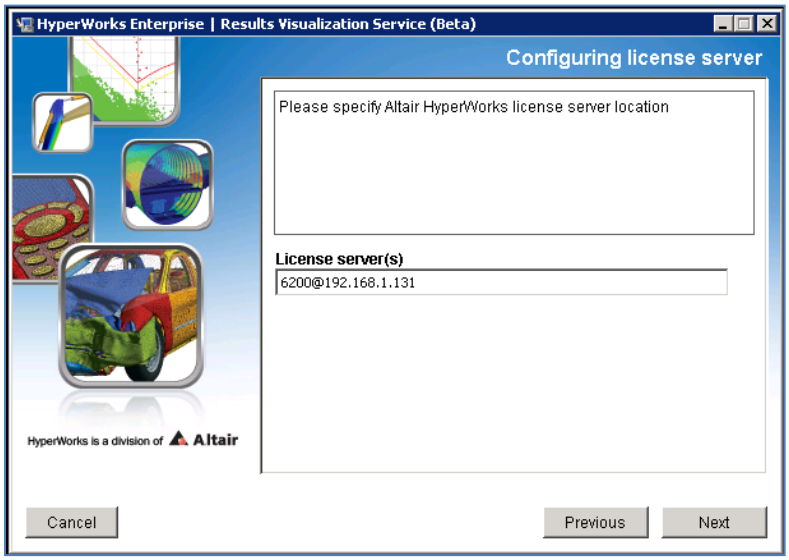
3. Review the license agreement



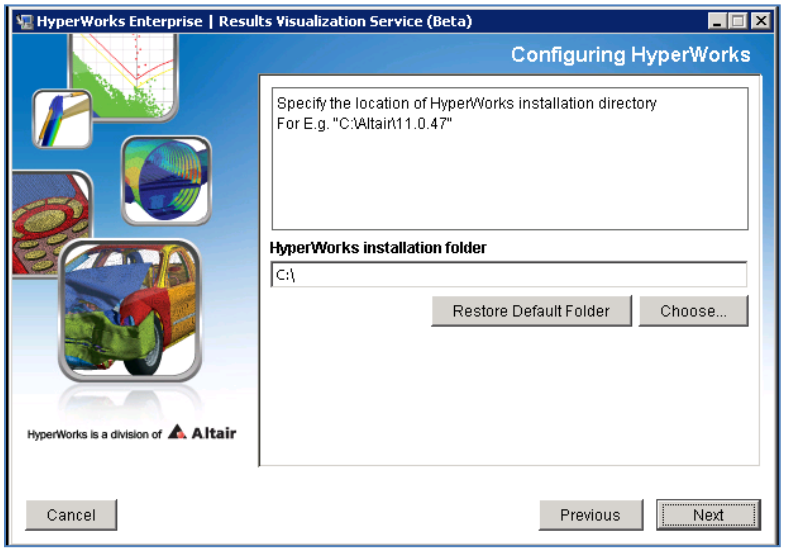
4. Choose a folder to install the service.



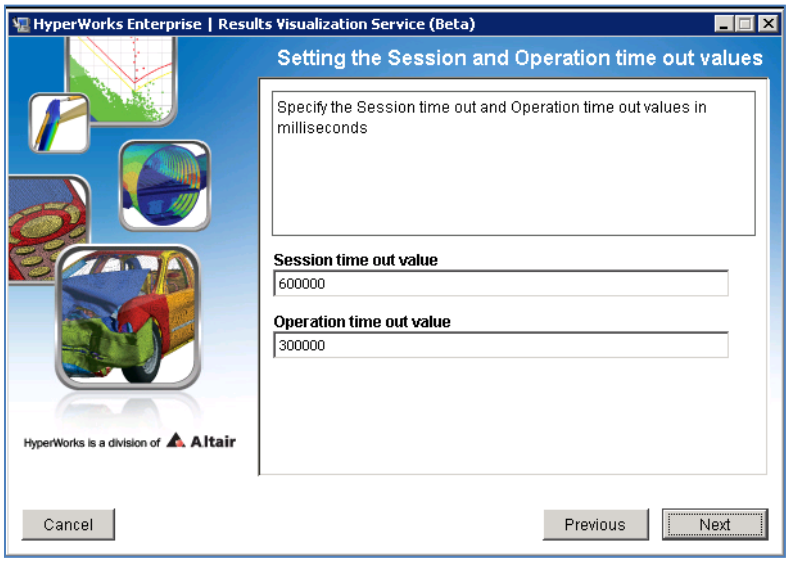
5. Provide the HyperWorks license server details. The Results Visualization services will use the HyperWorks tools to generate the plots and animations.



6. Select the HyperWorks installation location

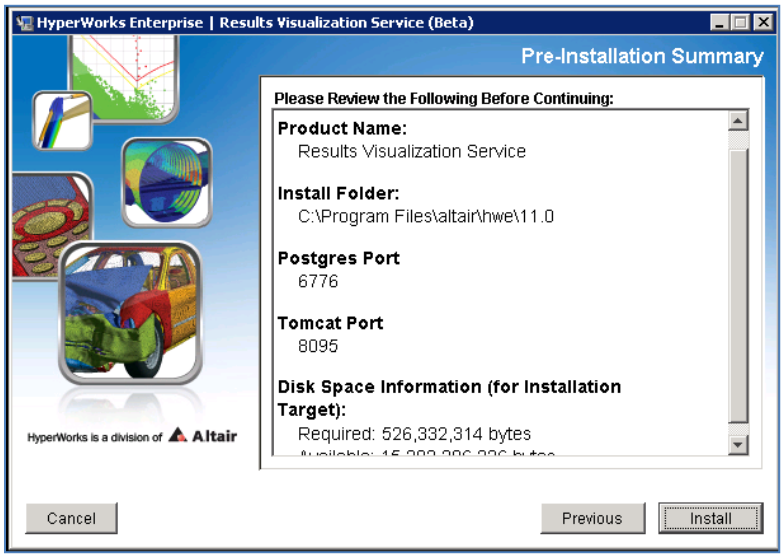


7. Leave the Session & Operation Time Out at their default values. You can tweak them later if required.

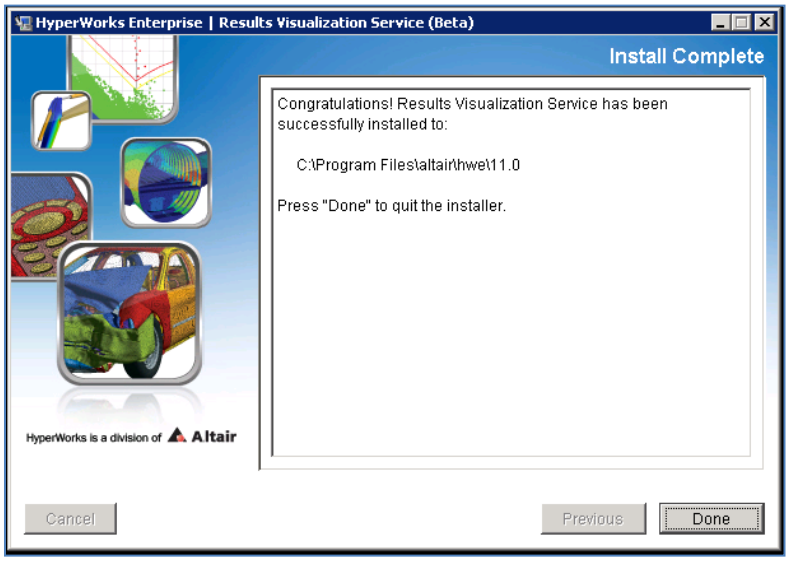


8. Provide the PBS Professional application server details.

9. Review the summary details and proceed to install.



10. Click “Done” to complete your installation.



5. Starting and Stopping of Service

A “Root” or an “Admin” user depending on the OS can start or stop the service.

5.1 Windows

- **Start** the service by executing the script “<Product_Home>/awpf/scripts/hweportal.bat start”
- **Stop** the service by executing the script “<Product_Home>/awpf/scripts/hweportal.bat stop”
- Check the **status** of service by executing the script “<Product_Home>/awpf/scripts/hweportal.bat status”
- **Restart** the service by executing the script “<Product_Home>/awpf/scripts/hweportal.bat restart”

5.2 Linux

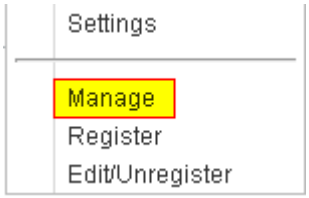
- **Start** the service by executing the script “<Product_Home>/awpf/init/hweportal start”
- **Stop** the service by executing the script “<Product_Home>/awpf/init/hweportal stop”
- Check the **status** of service by executing the script “<Product_Home>/awpf/init/hweportal status”
- **Restart** the service by executing the script “<Product_Home>/awpf/init/hweportal restart”

6. Registering PBS Application Services

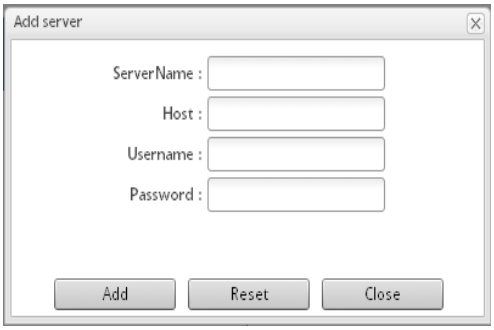
After installing HyperWorks® Enterprise Results Visualization service, the PBS Application services should be manually registered to the HyperWorks® Enterprise Compute Manager.

Follow these steps to register the service into Compute Manager.

- Login as administrator into Compute Manager
- Click on the Settings button  on the top right corner and select ‘Manage’



- Provide the PBS Application services details and click ‘Add’



- Upon seeing the server registration confirmation message, click on ‘Ok’.

7. Registering Results Visualization Server with Compute Manager

For every PBS Application Services Server registered in Compute Manager, you need to specify the respective Results Visualization server for sending post-processing requests.

You can specify the above said server mappings in the file –
“<CM_Product_Home>/services/rm/config/rm_servers.xml**”**

Sample XML:

<AIFServers>

*<Server name="MasterServer1" rmServiceBaseURL="**http://server:9080**"*
*isDirectlyAcessible ="**false**" />*

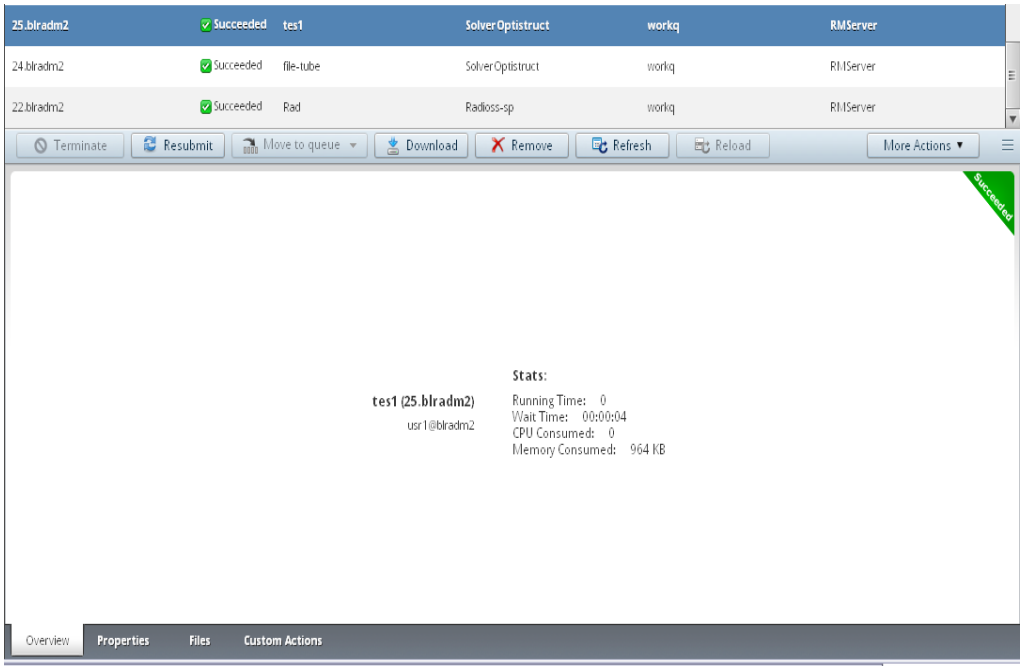
</AIFServers>

- **Server Name** – Specifies the PBS Application Server Name which registered with Compute Manager.
- **rmServiceBaseURL –** Refers to Results Visualization service base URL.
- ***isDirectlyAcessible*** **-** Specifies whether the PBS Application Server is directly accessible to Results Visualization server (on same network), so that result files will not be downloaded to Results Visualization server for post processing.

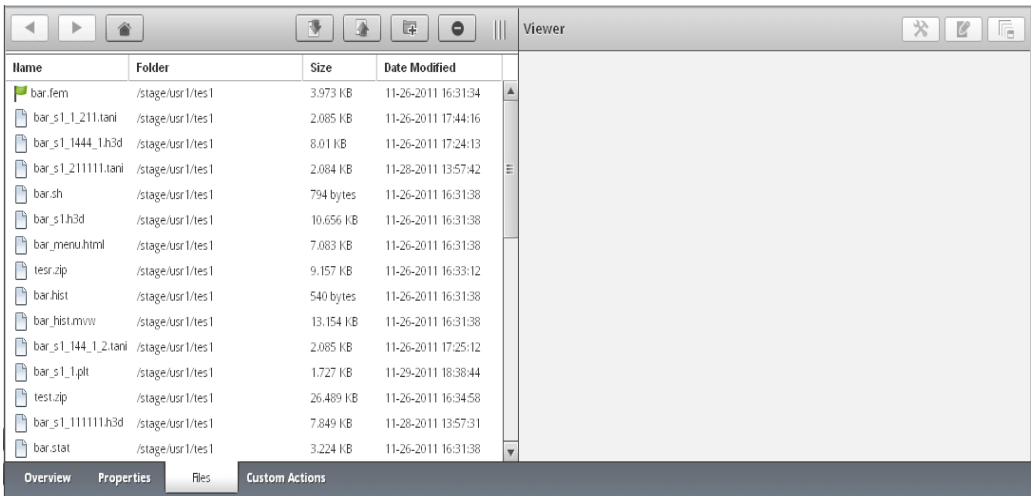
8. Generating plot information

The following steps will generate the plot information from the selected result file.

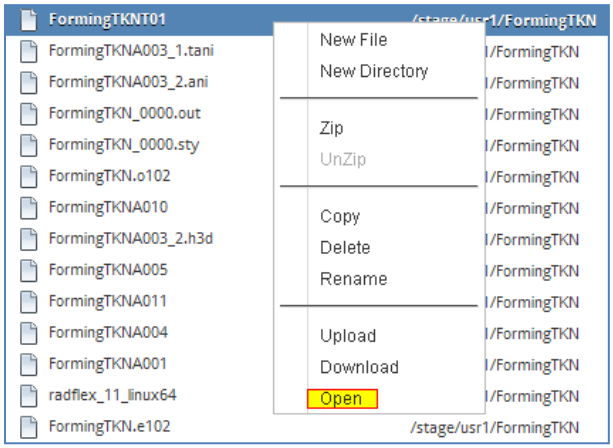
- Login to Compute Manager with your user account
- Provide the login details of PBS Application services (The account details has to be provided during first login session, subsequent login sessions use the same account details)
- Select a Running or Succeeded job and it opens a frame below providing the overview of the job details



- Switch to the Files tab and it opens a Viewer frame on the right



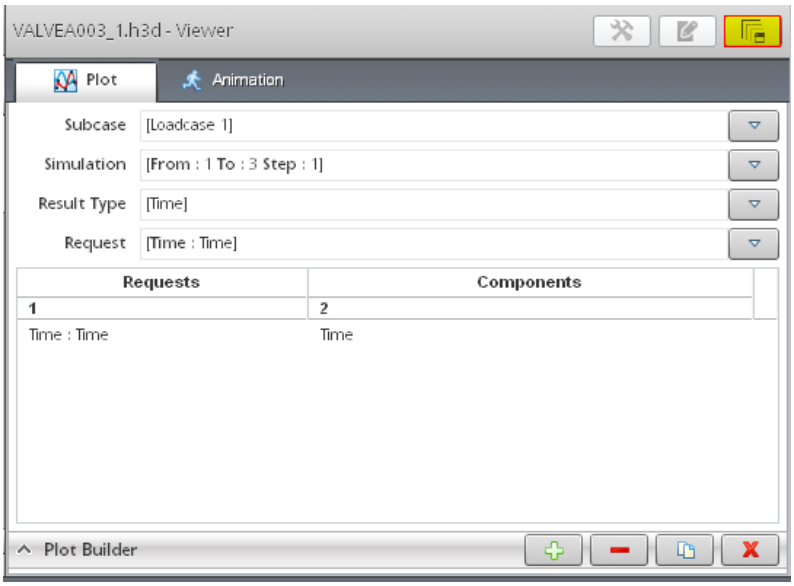
- Select the file, then right-click, and click on Open. This will fetch the table of contents from the server (For ex- *.h3d)



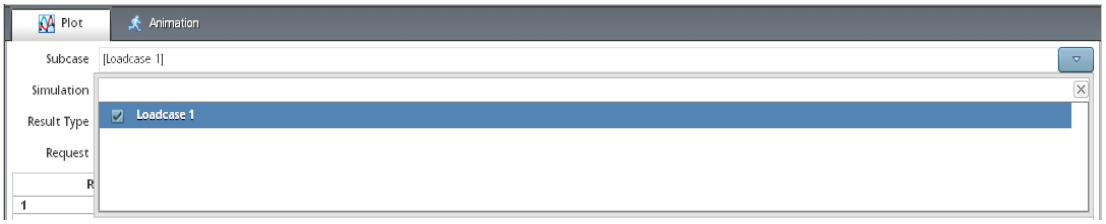
- If the file has both plot and animation information in it, then the plot section is displayed by default.

Note: The default TOC type (plot or animation) will be identified depending on the file type registered with the service.
(Ex.: If [*.req] is registered as Plot TOC type, then Plot TOC will be fetched when the user selects a file with .req extension).

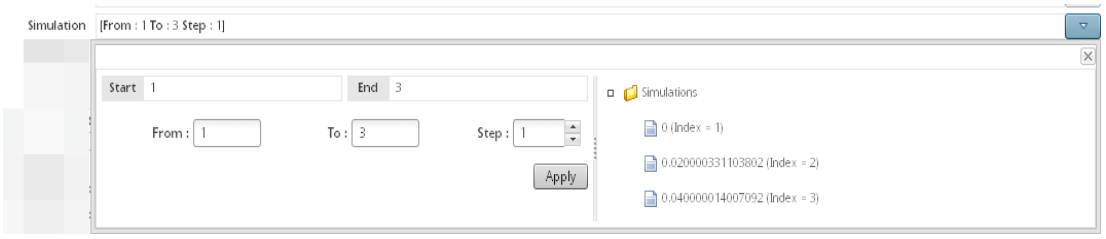
- You can maximize the frame by clicking on the maximize button highlighted.



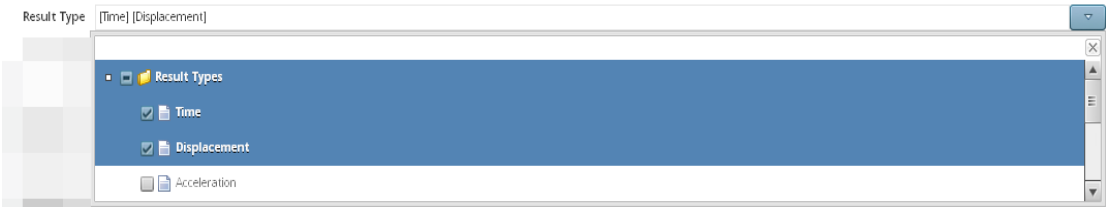
- Select the required Subcase, Simulation, Results Type and the Request for Plotting.
- Use the pull down menu in the Subcase section and select the required load case. Click on the pull down menu again or the cross button to close.



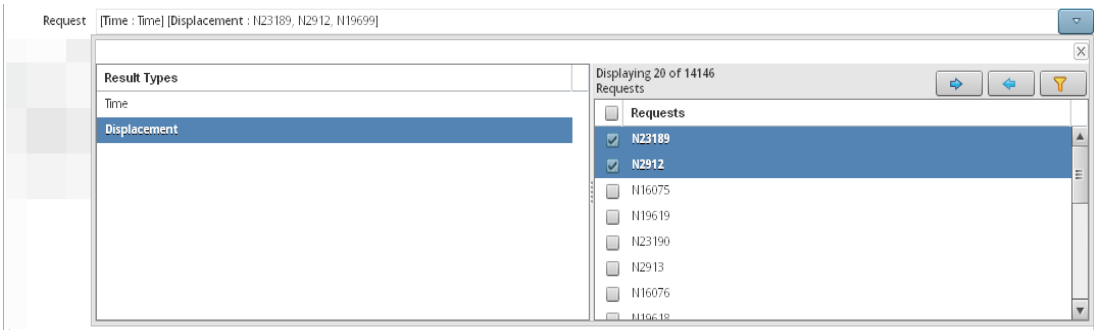
- Use the pull down menu in the Simulation section to select the required simulation. You can also choose the Start, End and Step values. Click on the pull down menu again or the cross button to close.



- Use the pull down menu in the Results Type section, and select the required result types. Click on the pull down menu again or the cross button to close.



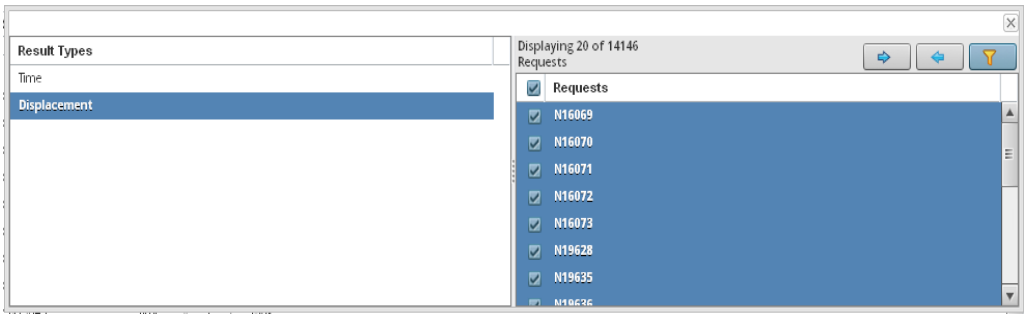
- Use the pull down menu in the Request section, and select the required result types. Click on the pull down menu again or the cross button to close.



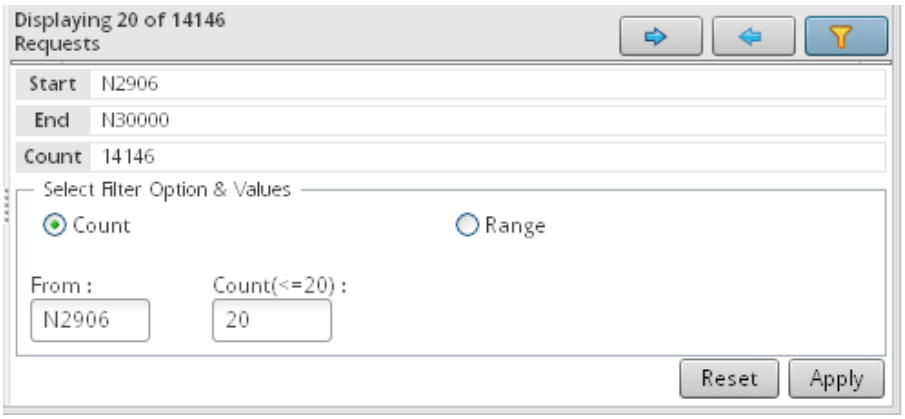
Note: Only the first 20 requests are shown by default, if you plan to add more requests you can do it by using the navigation buttons or by using filtering

 - Navigates to next 20 values

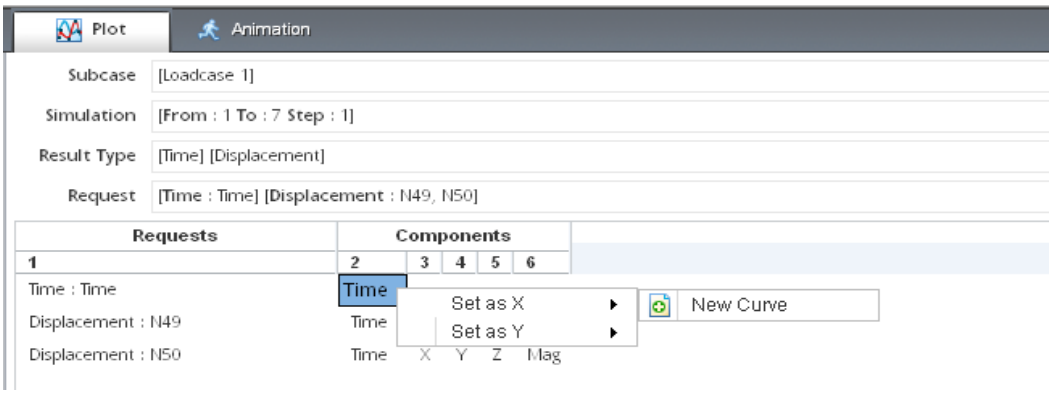
 - Navigates to previous 20 values



 - Allows you to filter using counts or specifying a Range

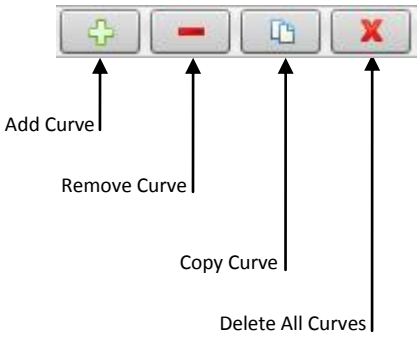


- After selecting the required values, assign the X and Y axis components either by dragging & dropping them into the Plot builder or by right-clicking and selecting ‘Set as X’ or ‘Set as Y’ from the drop down menu in the component section.

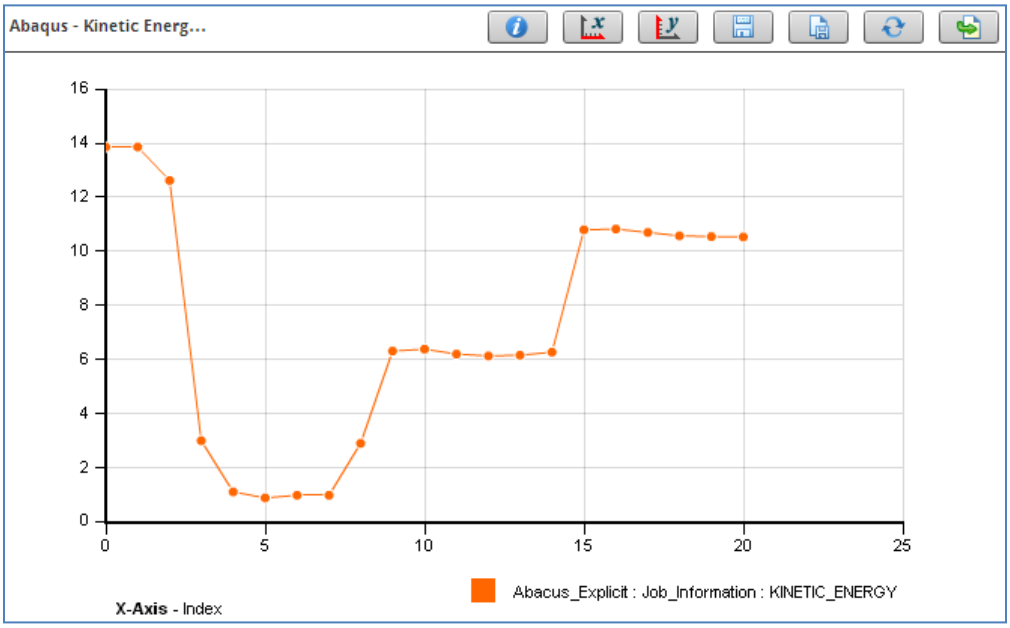


- Provide the title for the plot and click on the Plot button to generate the Plot

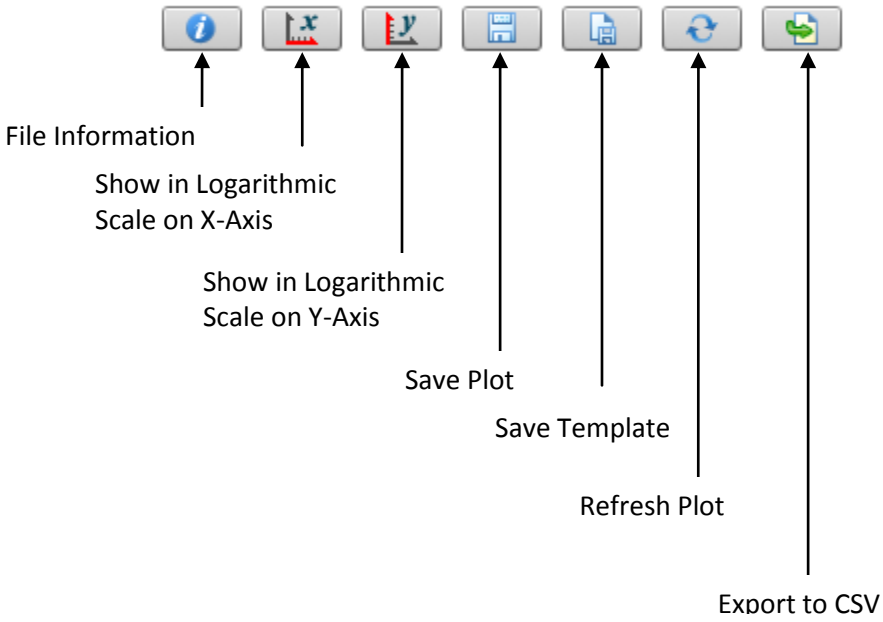
Note: You can also add multiple curves, delete, copy and delete all of the curves through the Plot builder



- The plot results will be displayed as per the parameters chosen

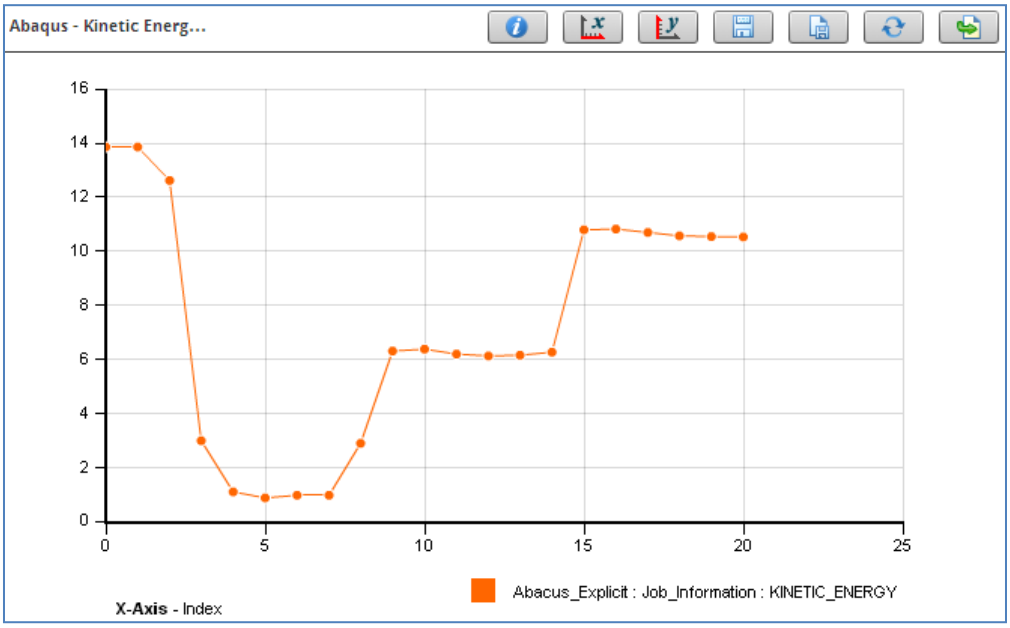


Note: You can also perfom other actions in the plot results like file information, save, switch between normal and logarithmic scale, refresh and export.

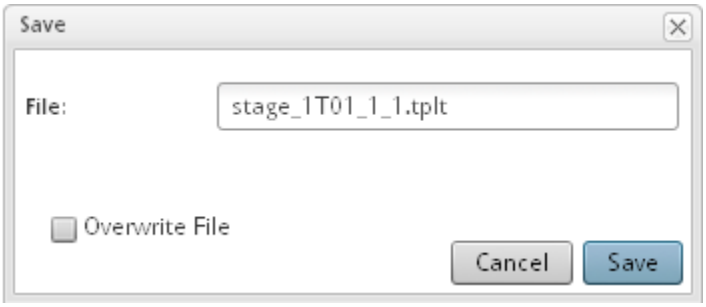


8.1 Generating plot template

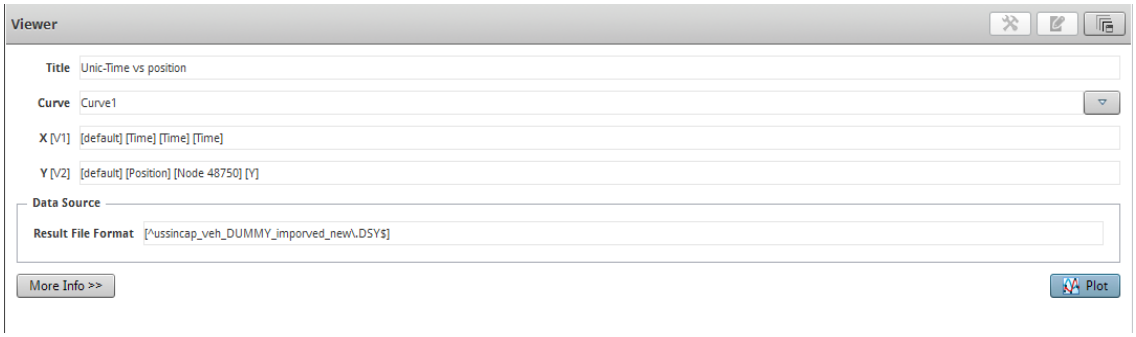
After generating a plot, you have an option to save the plot parameters as a template for reuse. The file is saved with ".tplt" extension.



Click the Save template button, and provide the name for template file. You have an option to overwrite the old file.



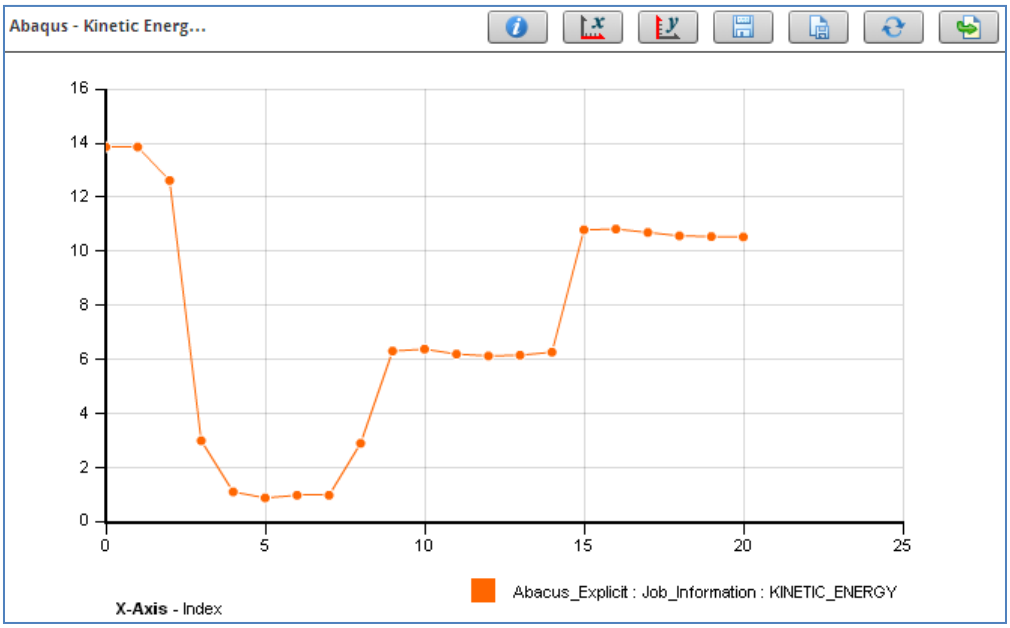
Double-click and open a “*.tplt” file to generate a plot.

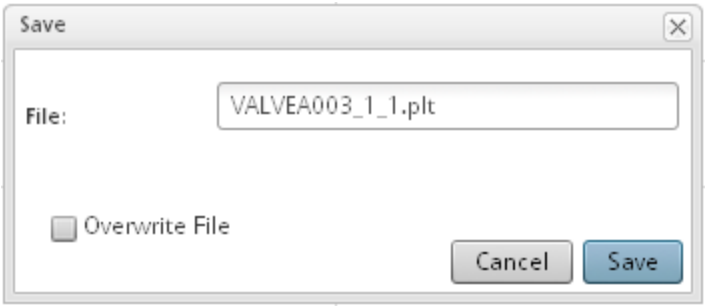


Note: When you are requesting the plot information using *.tplt file, it will in turn send the request to server and fetch the results from the server.

8.2 Saving plot results

After generating a plot, you have an option to save the plot results to the server. The file is saved with “.plt” extension. Double-click on a “*.plt” file to view the results.



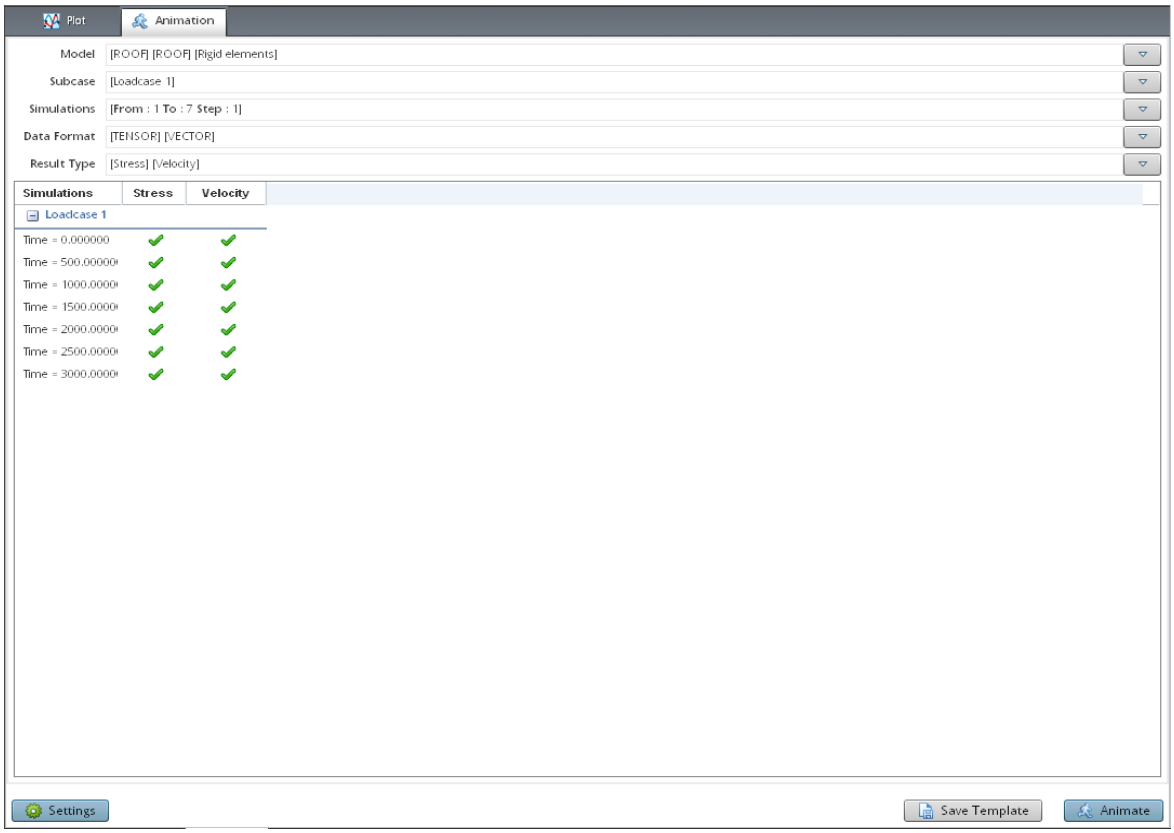


Note: When you are requesting the plot information using *.plt file, it will plot the information available in the .plt file.

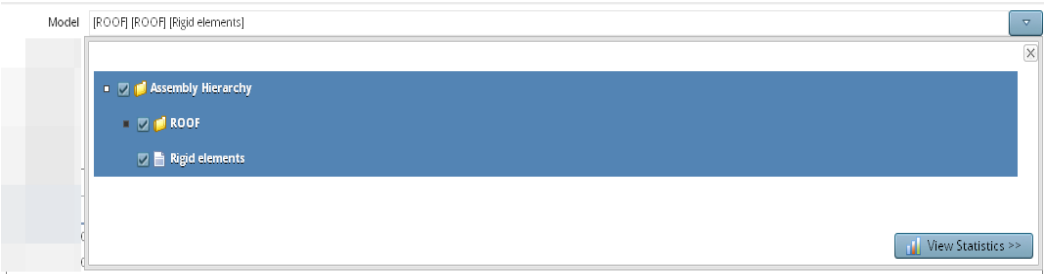
9. Generating animation information

The following steps will help you to generate the animation information from the selected result file –

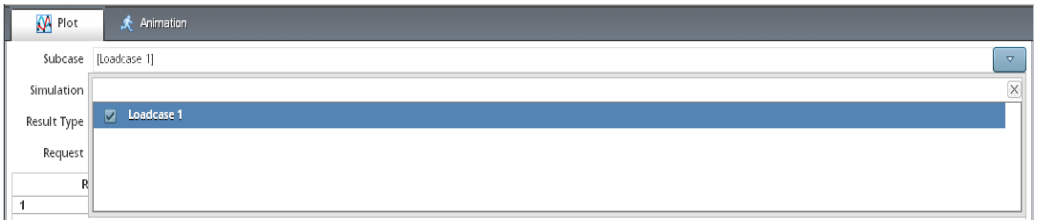
- Select a Running or Succeeded job, and it opens a frame below, and provides the overview of job
- Select the file for which you need animation data, and perform right-click open
- This will start fetching the table of contents, and then show the following page, and you can select the required parameters for animation



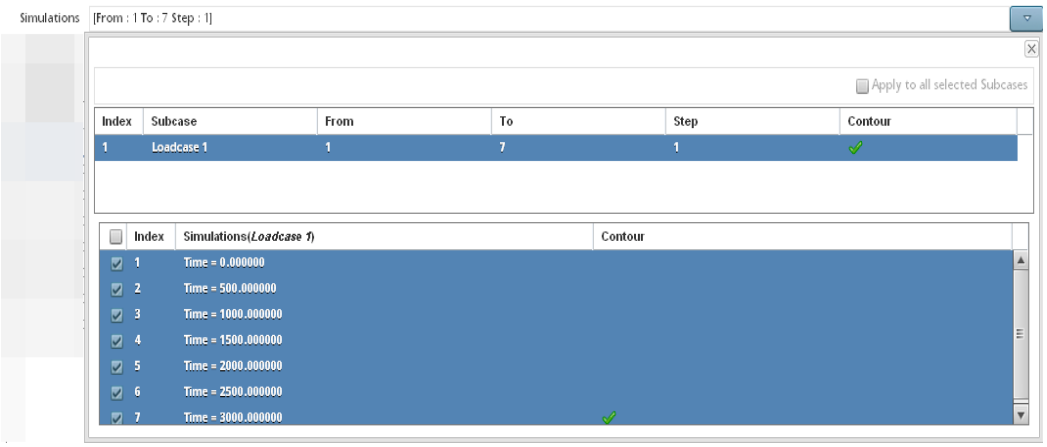
- Use the pull down menu in the Model section and select the required models.



- Use the pull down in the Subcase section, and select the required load case.

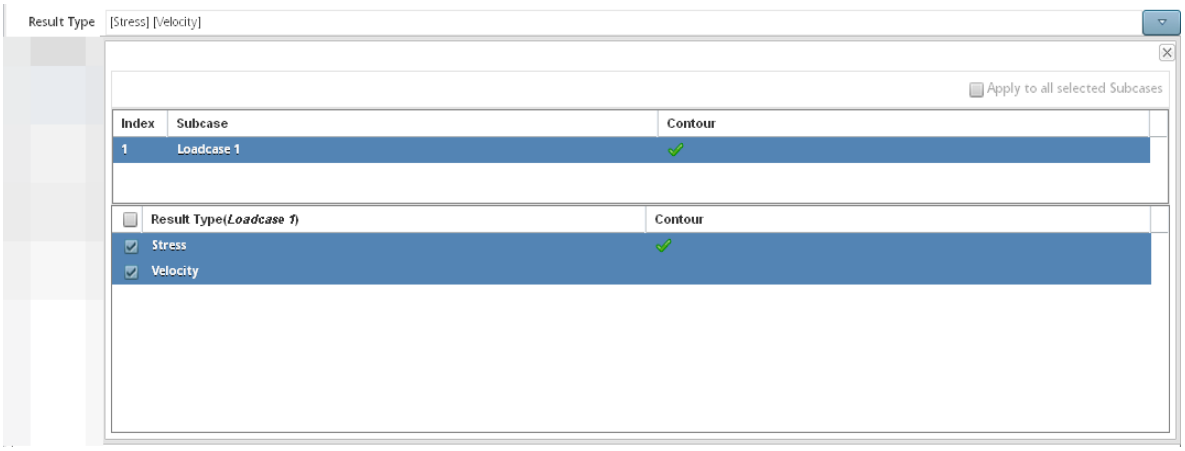


- Use the pull down in the Simulation section, and select the required load case and simulation values. Click on the pull down menu again or the cross button to close

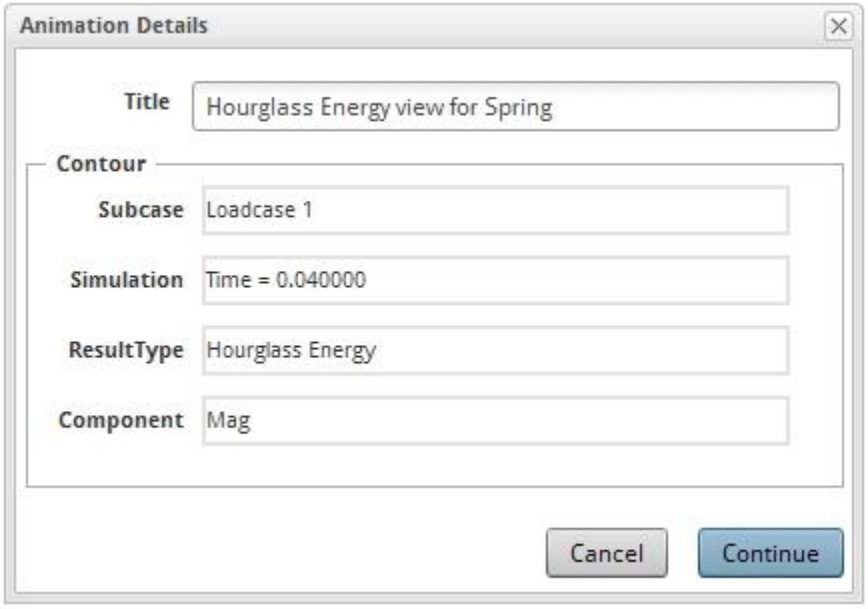


- Use the pull down in the Data Format section, and select the required data formats. Click on the pull down menu again or the cross button to close

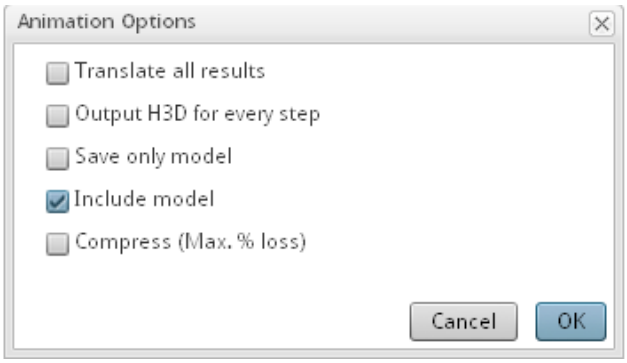
- Use the pull down in the Results type section, and select the required result types. Click on the pull down menu again or the cross button to close



- Once you have selected the required animation parameters, click on the Animate button, provide the title and click 'Continue's



Note: You can also provide additional options available using the 'Settings' options before generating the animation

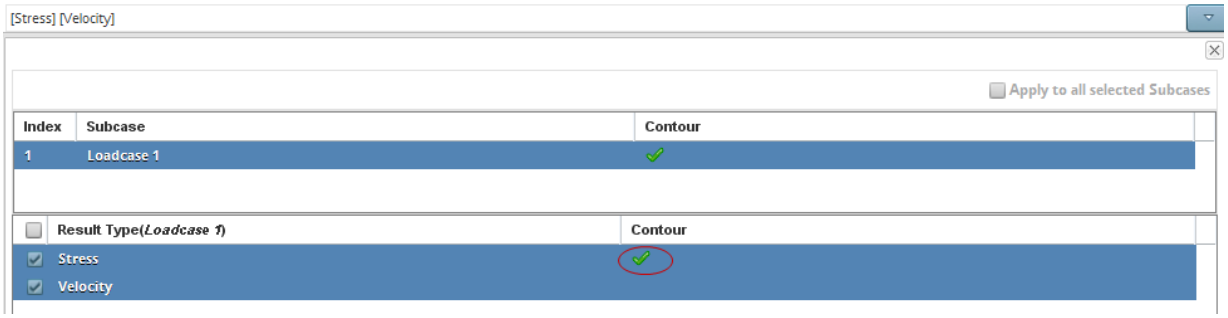


Note 1: You will need to have the HyperView Player plug-in installed to view the animations. Below are the steps to download and install the player.

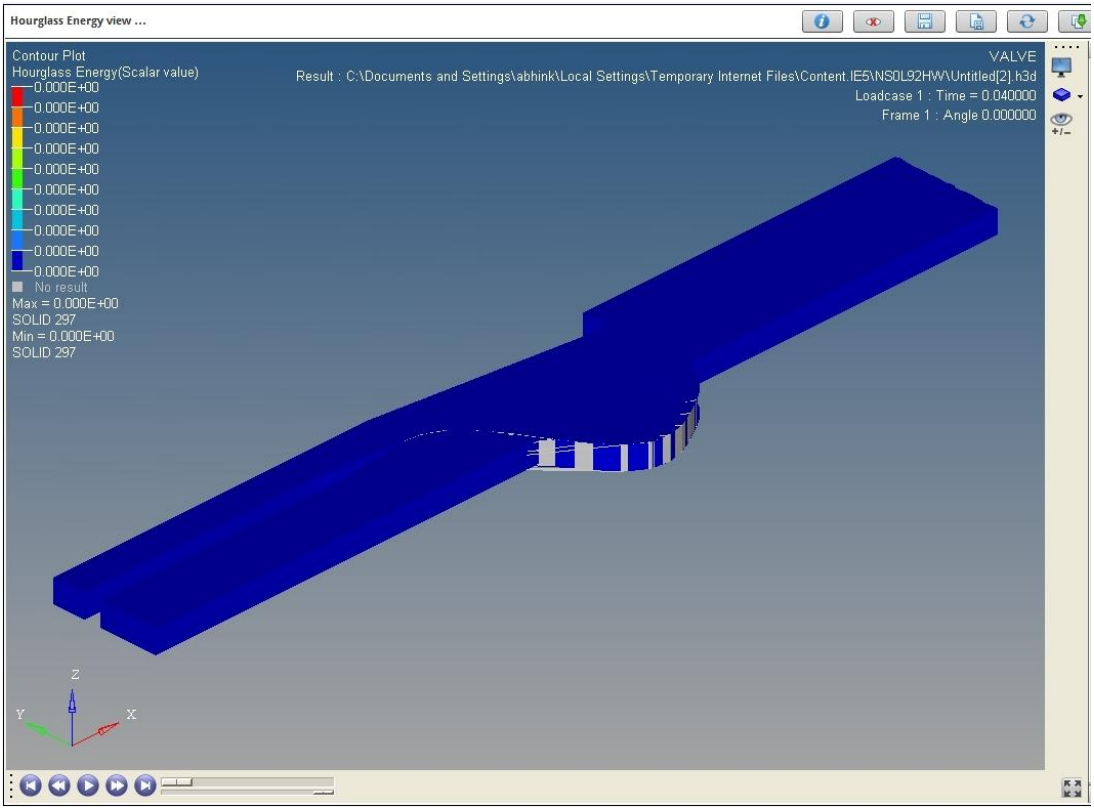
Follow these steps to install and configure the HyperView Player plug-in for browsers

1. Download and install the HyperView player installer from the Altair website. (http://www.altair.com)
2. After installation, register the HVP Control by invoking a file at "<Altair_Home>\hw\bin\win32/64\regHvpDll.bat"
3. Edit all the *.htm files located at "<Altair_Home>\demos\hvp". Change the parameter 'inplace' value to "1" and open those files in the browser

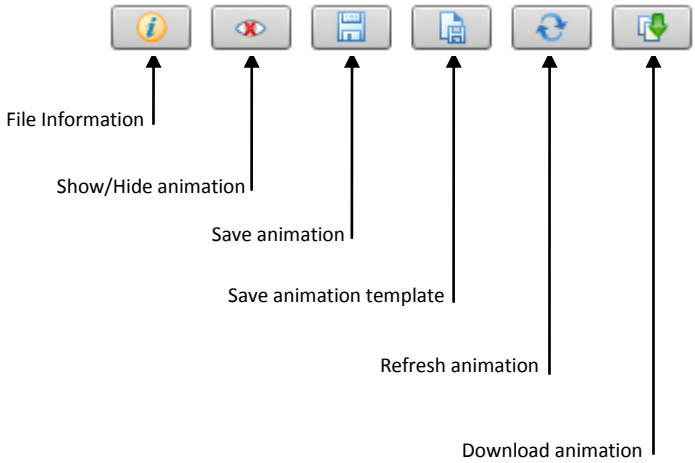
Note 2: Only one Contour can be selected for each animation. If another contour is required please reselect from Animation-Table of Contents and generate the new animation result. You can also select the contour by choosing the contour options available when selecting the Result type, Simulations and Components. Please refer to the below image for choosing the Contour.



- The animation results will be played in the HVPlayer embedded in the browser

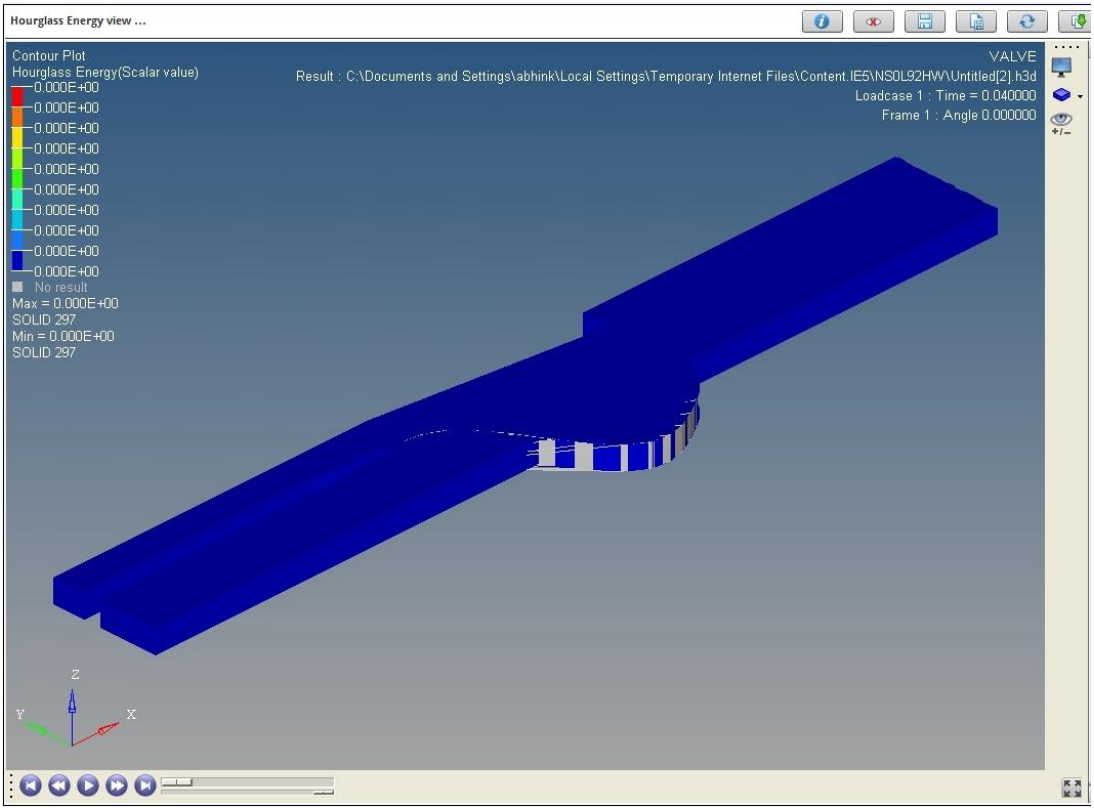


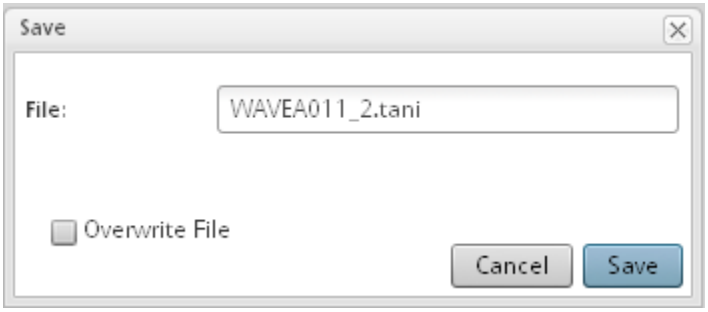
Note: You can also perfom other actions in the animation results like file information, save, download, etc.



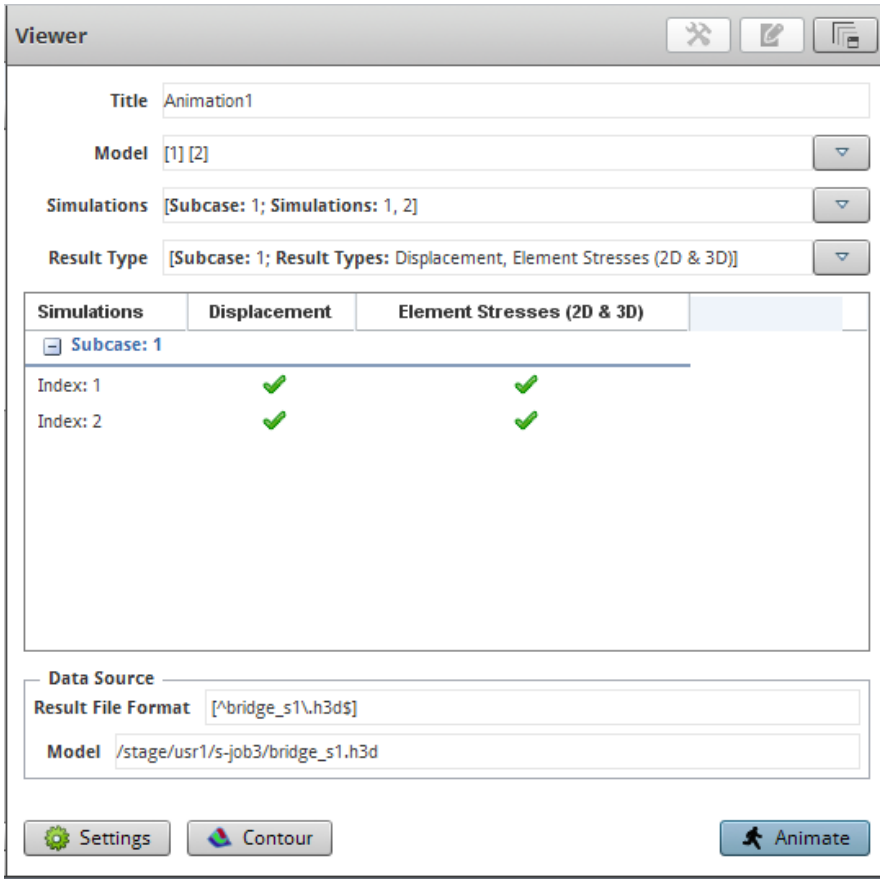
9.1 Generating animation template

After generating an animation, you have an option to save the animation parameters as a template for reuse. The file is saved with extension ".tani".





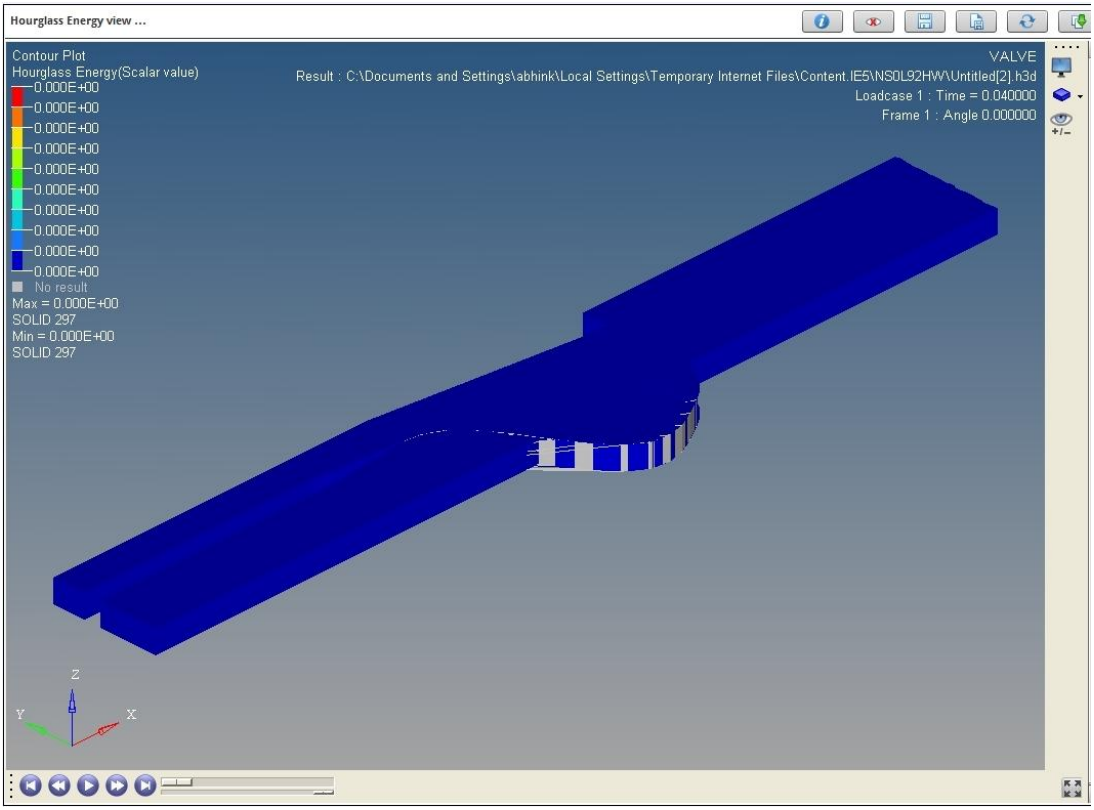
Perform double-click to open a “*.tani” file. The selected parameters are shown and then you can animate. You cannot make any changes in data.

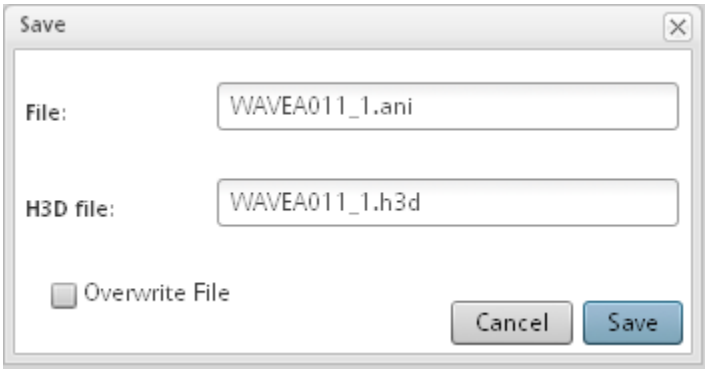


Note: When you are requesting the animation information using “*.tani” file, it will in turn send the request to server and fetch the results from the server.

9.2 Saving animation results

After generating an animation, you have an option to save the animation results file. The file is saved with extension ".ani". Perform double-click on a "*.ani" file to view the animation.



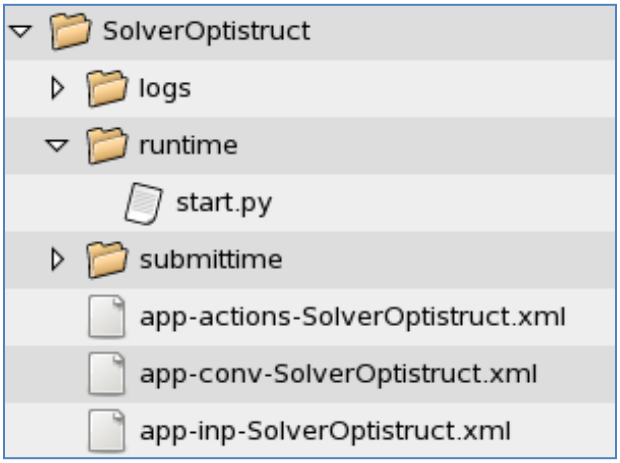


Note: When you are requesting the animation information using *.ani file, it will open the local copy available in the server

10. Configuration of PBS Application Services for Predefined Templates

This section provides the details on how to configure PBS Application Services application definition to automatically copy the pre-defined RM plot and animation templates to job execution directory when the job starts.

Below is the sample "SolverOptistruct" application definition directory structure:



Let's say you have two predefined RM templates (**Template1.tplt** and **Template2.tani**) that need to be copied to job execution directory when job starts.

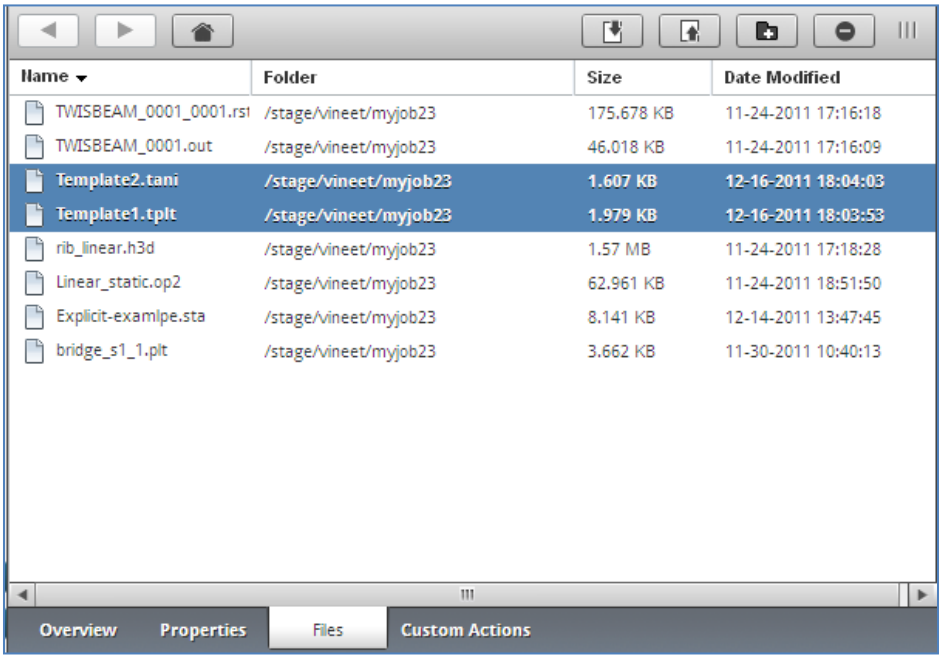
Here are steps that need to be followed:

1. Stop PBS Application Services
2. Copy the template files to "**runtime**" directory of application definition.
3. Edit the "**start.py**" to include' copy' statements.
   E.g.:
   import shutil
   shutil.copyfile("runtime/Template1.tplt", " Template1.tplt ");
   shutil.copyfile("runtime/Template2.tani", " Template2.tani ");

4. Start PBS Application Services.

*[**Note**: For information on how to start and stop PBS Application Services, please refer PBS Application Services user guide or contact your local administrator.]*

Now, whenever a new job is submitted for “SolverOptistruct”, the template files will be automatically copied over to job execution directory.



11. Supported result file types

Plot –TOC/Data	Animation-TOC/Data
Radioss Bulk:	**Radioss Bulk:**
*.op2	*.op2
*.h3d	*.h3d
*.res	*.res
*.pch	
Radioss Block :	**Radioss Block :**
*A00#	*A00#
*.T##	
*.gz	*.gz
Optistruct :	**Optistruct :**
*.op2	*.op2
*.h3d	*.h3d
*.res	*.res
*.pch	
MotionSolve:	**MotionSolve:**
*.mrf	

*.abf	
*.plt	
Abaqus :	**Abaqus :**
*.odb	*.odb
*.dat	
*.out	
ADAMS:	**ADAMS:**
*.req	
*.res	
Ansys :	**Ansys :**
*.rst	*.rst
*.rth	*.rth
*.rmg	*.rmg
CFX :	**CFX :**
*.out	
Fluent:	**Fluent:**
*.out	
output*	
Ls-Dyna :	**Ls-Dyna :**
d3plot	d3plot
*.db	*.db
*dynain	*dynain
*.fz	*.fz
Intfor	intfor
Ptf	ptf
Marc:	**Marc:**
*.t16	*.t16
Nastran :	**Nastran :**
*.op2	*.op2
*.pch	
NIKE3D:	**NIKE3D:**
*n3plot	*n3plot
Pamcrash :	**Pamcrash :**
*.DSY	*.DSY
*.erfh5	*.erfh5
*.THP	
*.fz	*.fz
Permas :	**Permas :**
*.h3d	*.h3d

Note: The default TOC type (plot or animation) will be identified depending on the file type registration with Results Visualization services. (Ex.: If [*.req] is registered with Plot TOC type, then Plot TOC will be fetched when user selects a file with .req extension)

12. Server tuning recommendations

Results Visualization Application server configurations

Parameters	Default Value	Tuned Value	File path
JVM (Max)	1024	2048	Windows: <Product_Home>\awpf\script\hweportal.bat ***(CATALINA_OPTS=-Xms256m -Xmx2048m)*** Linux: <Product_Home>/awpf/scripts/ server-start.sh ***(CATALINA_OPTS=-Xms256m -Xmx2048m)***

Results Visualization Configurations

Parameters	Default values	File path
TOC size	2097152 (In bytes)	<Product_Home>\rm\config\ site_config.xml
Xvfb display	11	
Impersonation	True	
Cache enabled	True	

Parameters	Default Value	Tuned Value	File path
Socket timeout	6000	6000000	<Product_Home>\ rm\config\site_config.xml (socketTimeout="6000000" connectionTimeout="6000000")
Connection timeout	6000	6000000	

HMath server (Plug-in) configurations

Parameters	Default Value	Tuned Value	File path
Socket timeout	6000	6000000	<Product_Home>\ \rm\plugins\hypermath_application \plugin_def .xml (socketTimeout="6000000" connectionTimeout="6000000")
Connection timeout	6000	6000000	

PBS port server (Plug-in) configurations

Parameters	Default Value	Tuned Value	File path
Socket timeout	6000	6000000	<Product_Home>\rm\plugins\ pbs_datasource_handler\plugin_def .xml (requestTimeout="6000000" connectionTimeout="6000000" idleTimeout="21600000")
Connection timeout	6000	6000000	
Idle timeout	21600	21600000	

For Linux:

Parameters	Default Value	Tuned Value	Command
File descriptors (-n)	1024	2048	> ulimit –n 2048

Results Visualization Configurations

Parameters	Default Value	File path
H3D file size supported in browser	26214400 (bytes)	< ComputeManager_Product_Home>/services/rm/config/ config.properties (maxH3DFileSize=26214400)

13.Known issues

Results Visualization:

S. No.	Description	Cause	Resolution
1	Unable to get TOC in Internet explorer-browser	Issue with GWT. Unable to catch the exceptions.	This is a known product issue.
2	HVP Browser Plug-in does not show the result/model with appropriate animation type.	Issue with HVP Plug-in. It always plays the file with animation type as “Model” when Contour parameters are passed.	Download the HVP Plug-in fix from Compute Manager User Area/Downloads Page (Extras section) and read the further instructions on how to patch the local HVP installation. Or Please contact your local administrator for more information.
3	HVP Browser plug-in does not display contour plot in Linux.	This is an issue with HVP Plug-in on Linux.	This is a known product issue.
4	Unable to get Plot TOC for .plt	Due to file extension conflict	This is a known product

	- Motion Solve Result File.	between Motion Solve result file and RM Plug-in Plot Template instance file.	issue.
5	Plot is displayed, only if Adobe Flash plug-in is installed and enabled in browsers.	The current version of Plot widget supports only Flash version.	This is a known product issue.
6	Not able to show/hide (toggle)individual curves in a plot	The current version of Plot widget does not support toggle feature.	This is a known product issue.

Results Visualization Services:

S. No.	Description	Cause	Resolution
1	Failure rate of more than 20% is observed when more than 30 concurrent results service requests are sent	Socket timeout and PAS sends broken pipe response when there are a large number of requests.	Only concurrent requests up to 30 are supported in the current release.
2	Time taken for extracting a part of data for some file formats is more compared to HVTrans UI	Issue from Core HVTrans batch mode. The batch mode is taking more time than HVTrans UI mode	This is a known product issue. Contact support for more help.
3	An error dialog is presented when reading some *.key (Ls-Dyna) model files.	Issue with reading some *.key files using HVTRANS, a HW translator used for reading TOC (Table of Contents)	Try reading a d3plot file for both model and results instead of .key file for model. This is a known product issue. Contact support for more help.
4	MBD *.h3d, Flex *.h3d and *.maf and are not supported for extracting animation TOC	Not all file formats supported in HW Desktop products are supported in results visualization service	This is a known product issue.
5	Not able to extract plot information for Abaqus, CFX and Fluent log files (.out, .sta)	These files are not read by default in HyperWorks.	Download the HyperWorks Log file readers patch from Compute Manager User Area (Extras section) and read the further instructions on how to patch the local HW installation. Or contact your local administrator for more information.
6	Services will not start if the installation directory path	The startup script has issue with folder path	This is a known product issue.

	contains spaces in Linux platform	containing spaces.	
7	Not able to extract plot data/TOC for H3D files in Windows.	The HyperMath server is not able to extract plot information in Windows.	This is a known product issue.
8	Does not automatically read the rest of the files in series (E.g. d3plot01, d3plot02...) when only master file (d3plot) is selected and the PAS server is not directly accessible.	The recommended setup is to make the staging or the job execution directory available to Results visualization server as mounted drive or path resolved.	This is a known product issue.