Release Notes for HEEDS | MDO v2014.11

New Features

- **New license server binaries**

  This version uses a newer version of the license server software. As a result, you WILL need to upgrade the license server installation if you have an existing license server. Your existing license file will work with the new server. Please see the installation guide for instructions on how to install the license server.

- **New Runtime Monitoring**

  This release of HEEDS MDO includes a completely redesigned runtime monitoring area, which is available in both the modeler and the post-processor. This new capability lets the user review the status of completed, running and pending designs. It provides information on the number of designs currently running for each analysis, even when running in parallel mode. All messages can be reviewed at the design analysis level for a quick review.

- **Local Response Surface Models in POST**

  This feature provides the capability to create local response surface models from within HEEDS POST. A local response surface is created by fitting a mathematical model to the response data from a study. The local response surfaces are created in HEEDS POST are then also available for use as a response in another HEEDS MDO study.

- **Many Objectives Pareto Optimization Method - NSGA-III**

  NSGA-III is a Pareto optimization method that works well with problems that have many objectives (3 or more). It is an extension of the NSGA-II algorithm, which is used within SHERPA. The main difference between the two algorithms is that NSGA-III uses a set of reference points to maintain the diversity of the Pareto points during the search. This results in a more even distribution of Pareto points across the objective space, even when the number of objectives is large.

- **Plot animations in HEEDS POST**

  Using the animation features, any plot or plot view within HEEDS POST can be animated. For example, this features allows you to easily visualize the progression of the Pareto front without having to manually change the cycles on the plot. It also allows the visualization of the design shapes (if you have images available) of different designs and how they evolved with the search progression.

- **Improvements to SHERPA**

The new version includes updates to SHERPA, which allow it to always run the requested number of parallel designs for every cycle. The changes also include some small performance upgrades.

- **Re-attach to a running study**
  If HEEDS MDO is closed while a study is in progress, opening the project reattaches to the study if it is still running.

- **Scripting support for responses**
  This version includes support for script tagging responses in addition to the input parameters which were already supported. This allows you to easily and quickly create response tags.

- **Support for unlimited parallel evaluations**
  A new feature is available to allow you to use unlimited number of parallel evaluations.

- **Several minor bug fixes**

Patch 2 – Updated 03/08/2015

This patch release fixes:

- A bug in the Abaqus output portal, which resulted in reporting errors in successful evaluations.
- Several bugs in the HEEDS MDO user manual.
- A bug in the tagging where failure in updating some files was being reported incorrectly as a warning, when it should have been treated as an error.
- A bug where the response and analysis status were being set incorrectly to INFEASIBLE when the response value was negative.
- A bug in the multi-tag scripting of responses.
- A bug in remote execution which prevented files being copied to the remote machine with certain shells.
- A bug in the ANSYS portal. The new portal gave errors when used with ANSYS versions older than 15.0. The updated version in this patch allows use with earlier versions (tested with 14, 14.5 and 15.0).
- The default save option for Pareto SHERPA runs was switched to "Latest" best from "All".
- The summary table to show the actual value of discrete variables.
- Resolved issue with a large number of error designs causing an exit due to too many files open.
- GTI portal
  - If a response name contained a comma, none of the responses could be parsed. This is because the results file separator was a comma. The default results file separator was changed to "|" and an environment variable "HEEDS_GTI_RES_DELIMITER" can be used to change it.
  - Input file parsing failed if only a single case was active.
  - Evaluate response failed.

- o If an input file had no tags, the study failed.
- o The solver install location could not be edited.
- JMAG portal
  - o JMAG versions newer than 13.0 would not work with HEEDS even if 13.0 was installed. Versions 13.0, 13.1 and 14.0 are now supported.
  - o Version 13.1 is the default. If version 13.1 is installed, HEEDS will work with no changes. If version 13.1 is not installed, versions 13.0 or 14.0 will work, but the PortalCatalog.xml file needs to be edited. The portal doc contains instructions.

Known Issues

1. If using VCollab data in a model plot over Remote Desktop, be sure the following environment variables are set on remote machine:
   `VCOLLAB_SKIP_OGL_DRIVER_CHECK=1`
   `VCOLLAB_FORCE_OGL=1`

2. CAE portals require specific file extensions. Importing a project with the wrong file extension will not import the tags properly. Rename the file to use a supported extension.

3. To open any Excel workbook while a study is running, please start Excel and open the workbook rather than double-clicking the file in Windows Explorer.

4. When installing HEEDS MDO on a Linux machine using X11 forwarding, some of the fields may appear disabled. If this happens, you can try a different X server or try using the mouse controls to cut, copy and paste text into the relevant fields.

5. When creating a local response surface model in HEEDS POST using least squares, if you use fewer designs less than the minimum number required for least squares fit, the R^2 will be set to 1. The resulting fit most likely is not a good representation of the response you are trying to model. Please use the following rules of thumb for the minimum number of evaluations:
   Linear least squares: (#variables + 1) * 1.3
   Quadratic least squares: ((#variables + 1) * (#variables + 2) /2) * 1.3

6. This release does not support reading files from version 6.1 or earlier (.hds files). If you need to use an older project from one of these releases, please upgrade using version 2014.07.

7. The **setup** for the Adams portal is only supported on Windows. Once the setup is complete, study simulations can be performed on Windows or Linux.