MpCCI 4.2.0

II Release Notes

MpCCI 4.2.0-1 Documentation
Part II Release Notes
PDF version
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II Release Notes – Contents

1 Introduction MpCCI 4.2

The release notes relate to MpCCI 4.2.
MpCCI 4.2 represents a new release change over MpCCI 4.1. Please read the changes and features section ▷ 2 Changes and New Features in MpCCI 4.2.0-1 ◁ for more details.
MpCCI 4.2 is available as an upgrade from an existing MpCCI 4.1 installation.

2 Changes and New Features in MpCCI 4.2.0-1

2.1 MpCCI Platforms

MpCCI platform name for Linux and Windows has changed:

- linux_x86 is renamed to lnx3_x86.
  This platform designates a 32 bit linux operating system based on x86 processor type.
- linux_em64t, linux_amd64, sles10_x64 have been grouped into the two platform names lnx3_x64 and lnx4_x64.
  Both platforms are compatible for Intel and AMD 64 bit processor type.
  lnx3_x64 is dedicated for Linux with glibc 2.3 version.
  lnx4_x64 is dedicated for Linux with glibc 2.4 version.
- Former Windows platform names
  - winxp_(x86|em64t|amd64) for Windows XP and Windows XP 64 bit
  - vista_(x86|em64t|amd64) for Windows Vista and Windows Vista 64 bit
  - win7_(x86|em64t|amd64) for Windows 7 and Windows 7 64 bit

  have been grouped into the two platform categories:
  - windows_x86 for Windows XP, Windows Vista and Windows 7.
  - windows_x64 for Windows XP 64 bit, Windows Vista 64 bit and Windows 7 64 bit.

2.2 New FSIMapper

- New tool for performing a file based mapping using the FSIMapper (▷ X-1 Overview ◁).
  The FSIMapper is based on the MpCCI Visualizer tools. It supports Abaqus, FLUENT, MD NASTRAN and EnSight Gold file format.
  The following quantities may be mapped: temperature, pressure...
  The FSIMapper is available for the Linux and Windows MpCCI platforms and can be called by using the command `mpcci fsimapper`.

2.3 Coupling Server

- Neighborhood search (▷ V-3.3.1 Association ◁):
  - The automatic calculation of the neighborhood search parameters has been improved. In previous version degenerated elements did provide a larger number of orphaned nodes, because the method did consider only the minimal edge length of elements. Now the neighborhood search parameters calculation considers the mean length of elements.
  - New option to overwrite the calculated normal distance. The user should provide manually an absolute value in SI unit (▷ V-4.6.4 Relation Search ◁) which is applied for all coupling regions.
- Mesh checks (▷ V-3.2 Mesh Checks ◁):
  - Partial overlapping check may be disabled in the ▷ V-4.6 Edit Step ◁. The coupling mesh interface still requires an overlapping of the regions. This option gives the possibilty to have a mesh size ratio in one direction larger than 2.5 times the size of the overlapping size.

- Additional orphans information (▷ V-3.3.2.3 Orphaned Nodes and Elements ◁):
  - MpCCI server writes additional orphans information for each coupled mesh into the log file: for example the number of orphaned nodes is provided as absulute value and as proportion in percent.
  - Orphans information is only provided on a mesh if at least one orphaned node exists. This implies:
    * If no orphaned nodes exists at all the MpCCI Monitor and MpCCI Visualizer do not show the information.
    * If the coupling involved different coupled meshes and you have on one mesh no orhpans information, this mesh will be colored in gray.
- Synchronized one-way coupling is supported in the Coupling configuration menu for each code. (▷ V-3.4.3.3 Special Case: Unidirectional Transfer ◁)
- MpCCI tracefile writers:
  - EnSight Gold file format fix for supporting mixed elements in mesh.
  - EnSight Gold file format additional option to write the file at each coupling step. The user has to enable the option Sflush in the ▷ V-4.6 Edit Step ◁.
  - Comma separated values file format (CSV) is supported. This file format only outputs data from a point coupling system and global variables.
  - CCVX file format has been extended to contain coordinates in case of point coupling.
- MpCCI Monitor can connect to the same MpCCI server port number as the simulation codes.

2.4 MpCCI API

- Coupling manager version has changed to 420. Simulation codes using the MpCCI client library should be recompiled. It is recommended to use the variable `MPCCI_CCM_VERSION` in the mpcci driver structure.
- Changes in the list of quantities for coupling:
  - NDisplacement is not anymore supported. The user should use the NPosition quantity for the FSI. The MpCCI server internally works with nodal displacement for the mapping and converts it as nodal coordinate back.
    Nodal displacement quantity has different meanings: it may be an absolute or relative nodal displacement from the original grid or current grid position. For simplification point of view only NPosition nodal coordinate is preferred for the coupled simulation.
- Changes in the definition of a transformation on a local mesh (moving reference frame). MpCCI allows the definition of a motion attached to a part.
  The motion may be defined as a translation, rotation. Attaching the motion definition to a part allows different motions inside a mesh. The mesh groups a list of parts.
  The following list of functions resp. data structure has been renamed resp. extended:
  - smpcci_deft has been refactored to smpcci_pmot. The function additionally specifies the part ID for the motion. (see ▷ VIII-2.7.10 Definition of the Moving Reference Frame: `smpcci_pmot` ◁)
  - The data structure for the moving reference frame `MPCCI_MVREF` has been renamed to `MPCCI_MOTION` for supporting general motion type definition. The motion type has to be distinguished between moving reference frame and moving grid, rotation, translation movement. (see ▷ VIII-2.9.4 Moving Reference Frame Definition ◁).

- Function defining the nodal coordinates smpcci_pnod has been extended.
  The function may provide an optional rotational degree of freedom.

2.5 MpCCI Grid Morpher

- MpCCI Grid Morpher can be run in multi-threaded mode for the following platforms: aix51_power, hpux1123_ia64, macosx_intel64, lnx4_x64, windows_x86, windows_x64.
- Morpher options can be specified by a file (`".gmo"`).

2.6 MpCCI Environment

- Fix for getting the next available port for starting the MpCCI server. This avoids a termination of the MpCCI server if there is still an opened MpCCI Monitor.
- Improvement on handling a local MpCCI license server start/stop. The local license file was not correctly found by the MpCCI license command.
- MpCCI log file prefix change: the log file is prefixed with the string mpcci_ and the jobname prefix provided in the ▷ V-4.7 Go Step ◁.

2.7 MpCCI Visualizer and MpCCI Monitor

- Global variables can be displayed from the MpCCI server. This option is available in the Edit Step. (see ▷ V-4.6 Edit Step ◁).
- Additional vector display features:
  - The vector can be scaled with a relative or absolute value.
  - The vector drawing can be switched to arrow or line representation.
  - The default Drawskip value changed to 20.
- Additional picking feature: element can be selected by its element ID.
- Additional option for the `mpcci ccvxcat` command. The command provides the possibility to replace part names from the existing `"ccvx"` file. This feature allows to compare coupled data from the same model computed with two different CFD codes for example. The additional command option is -replace <old> <new> (see ▷ V-5.3.8 `mpcci ccvxcat` ◁).
- MpCCI Monitor can disconnect from running coupled simulation and reconnect at a later time.

2.8 Batch System

- Fix for submitting a batch job with specified host list or host pattern assignment from the MpCCI GUI.
- Improve the resource distribution in a batch system.
  - Distinguish SMP and DMP simulation code types for proper host assignment.
  - Homogenious distribution of multiple processes.

  See additional details in ▷ V-3.6 Coupled Analysis in Batch Mode ◁.
- Using MpCCI Grid Morpher in a batch system was not correctly handled. The resource distribution did not provide a dedicated host for the computation.

2.9 MpCCI GUI

- In the Coupling Step the copy of components is supported. So components may be used in several regions and not only once. Also the component properties name, part id and aux information may be edited (see ▷ V-4.4 Coupling Step ◁). This option is activated for codes having the CopyComponents property in

- In the Coupling Step the quantity settings for default, ramping and relaxation are now bound to the mesh and no longer to the code. This means that in different region sets one can choose different values for those settings.

2.10 Code Specific Changes

2.10.1 Abaqus

- Abaqus 6.12 is supported and only compatible with MpCCI 4.2 release.

- Abaqus 6.10 and Abaqus 6.11 are only compatible with MpCCI 4.0 and MpCCI 4.1 releases. These releases are not listed by the MpCCI Abaqus information command mpcci abaqus info.

- On request an adapter for Abaqus 6.10 and Abaqus 6.11 can be provided for Linux platform to enable the compatibility with MpCCI 4.2. The Abaqus installation will require an update of the adapter library and the user has to perform a modification of the MpCCI installation for listing the Abaqus releases.
  The instruction will be provided on request by contacting MpCCI support.

- Abaqus 6.12 performs at the last increment a final data exchange before exiting the coupled simulation.

- Additional coupling configuration option in the Go Step for Abaqus.
  Using the option Enforce quasistatic implies Abaqus to define a quasi static procedure as a transient simulation. The pseudo simulation time will be defined at MpCCI server side. Without this option a quasi static procedure is considered as a static analysis by MpCCI. Only the iteration increment is then sent to MpCCI server.

2.10.2 ANSYS

- Support of ANSYS 14.0 release.

- Additional environment variable to define the list of ANSYS products to use. In the case that MpCCI is not able to find a list of available ANSYS products for the ANSYS license file via the environment variable `ANSYSLMD_LICENSE_FILE`, the user can define the `MPCCI_ANSYS_PRODUCT_LIST` environment variable containing the list of products separated by colon, semicolon or space.
  For example:
  `export MPCCI_ANSYS_PRODUCT_LIST=ansys:ane3fl:strucds`
  It is required that ANSYS can run in standalone correctly and can get a license without any issue.

2.10.3 FINE/Hexa

- Support of FINE/Hexa 2.10-4 release only.

- The new FINE/Hexa solver has been renamed to FINE/Open by NUMECA International.

- MpCCI FINE/Hexa scanner displays the component name without prefix IDs. The component name is composed of boundary name, surface Id, block ID from the model.
- MpCCI FINE/Hexa scanner has the option to extract already prepared boundary for the coupling. This assumes that the model has been already prepared in the FINE/Hexa interface. This option is triggered by the option Select scan method in the Model Step in MpCCI GUI.
- Automatic definition of moving referene frames parameter can be used in combination with a partner code having also supporting a mesh motion.

2.10.4 FINE/Open

- Support of FINE/Open 2.11-1, FINE/Open 2.11-2, FINE/Open 2.11-3 release.
- Co-simulation perl module fixes: MpCCI generates a new `".run"` file beside the original with all necessary settings for the co-simulation. The new `".run"` file has the prefix mpcci_.
  To visualize the simulation result the user has to open the corresponding `".run"` file.
- MpCCI FINE/Open scanner displays the component name without prefix IDs. The component name is composed of boundary name, surface Id, block ID from the model.
- MpCCI FINE/Open scanner has the option to extract already prepared boundary for the coupling. This assumes that the model has been already prepared in the FINE/Open interface. This option is triggered by the option Select scan method in the Models Step in MpCCI GUI.
- Automatic definition of moving referene frames parameter can be used in combination with a partner code having also supporting a mesh motion.

2.10.5 FINE/Turbo

- Support of FINE/Turbo 8.9-2, FINE/Turbo 8.9-3,FINE/Turbo 8.10-1 release.
- Co-simulation perl module fixes: MpCCI generates a new `".run"` file beside the original with all necessary settings for the co-simulation. The new `".run"` file has the prefix mpcci_.
  To visualize the simulation result the user has to open the corresponding `".run"` file.
- MpCCI FINE/Turbo scanner displays the component name without prefix IDs. The component name is composed of boundary name, surface Id, block ID from the model.
- MpCCI FINE/Turbo scanner has the option to extract already prepared boundary for the coupling. This assumes that the model has been already prepared in the FINE/Turbo interface. This option is triggered by the option Select scan method in the Models Step in MpCCI GUI.
- Automatic definition of moving referene frames parameter can be used in combination with a partner code having also supporting a mesh motion.

2.10.6 FLUENT

- Remove the support for FLUENT 6.3.26 release.
- Disable SGE control from FLUENT. When running a coupled job under a SGE FLUENT ignores the number of processors specified at the command line and uses the total number of processors allocated for the coupled job. In that FLUENT is automatically started with the option -nosge.

- Specify the exit file name for interrupting a FLUENT computation. This allows FLUENT to properly terminates the computation by saving the data for a later restart.
- MpCCI FLUENT subcommand option libudf has been renamed to libmpcci.
- Run 64 bit version if available default option value changed to true.
- Automatic definition of moving referene frames and moving grid parameter can be used in combination with a partner code having also supporting a mesh motion.

2.10.7 ANSYS Icepak

- Support of ANSYS Icepak 14.0 release.

2.10.8 MSC.Marc

- Support of MSC.Marc 2010.2 and MSC.Marc 2011 release.

2.10.9 MD NASTRAN

- Support of MD NASTRAN 2011.1 release.
- Support of MSC NASTRAN 2012.1 release. MD NASTRAN and MSC NASTRAN have been consolidated to one product brand MSC NASTRAN. Multi-physics capability from the MD NASTRAN code can be retrieved in the MSC NASTRAN solution suite.

2.10.10 OpenFOAM

- Windows HPC support.
- Fix OpenFOAM `"controlDict"` preparation. In case that the model contains user defined library definition for some boundaries, MpCCI did not correctly update the libs entry.

2.10.11 RadTherm

- Support of RadTherm 10.0.2, RadTherm 10.1.0 and RadTherm 10.2.0 release.
  Older releases than RadTherm 10.0.0 are not supported anymore.
- Extended RadTherm installation search.
- Microsoft Windows architecture names have been renamed for the adapter library directory.
- No. of parallel processes entry has been renamed to No. of parallel solver threads. This is a fix for handling the distribution of the code on a batch system environment.
- Initial quantities transfer option has been extended. RadTherm is allowed to send, exchange and skip the initial quantities transfer action.
  Such applications like a one way mapping from RadTherm to a CFD simulation code is supported.
- Fix for supporting multilayer part in RadTherm model. The film temperature and heat transfer coefficient are correctly applied on the backside of the part.
  For multilayer part only the first and last layer are selected as front and back side for the coupling. Coupling of layer between the front and backside is not supported.

- Improve the portability of a RadTherm tdf file used for the coupling. The MpCCI RadTherm adapter library is not bound to the MpCCI installation. A local copy of the MpCCI RadTherm adapter library is performed before the code starts.
- MpCCI checks that there is no mixing part (front- and backside part) in the same coupled region set.
- RadTherm model is automatically checked and hooked by MpCCI before the simulation starts. The user does not need anymore to activate the RadTherm hook functions manually in the RadTherm GUI.
- MpCCI hooks automatically the Time Step Start and Iteration Start RadTherm hook functions. The MpCCI RadTherm adapter decides which hook function to use according to the simulation type (steady state or transient).
- Convection type is automatically adjusted to the type HandTfluid in the RadTherm model.
- Scanner:
  - Empty parts are not listed as candidates for the coupling.
    For example Fluid part is not listed.
  - Correctly retrieves the simulation type (steady state or transient) for the scanner process. A steady state simulation type is recognized by setting the end time simulation to zero.
  - Part ID definition for RadTherm backside component has been modified. Old MpCCI projects must be newly set up: RadTherm model has to be rescanned. RadTherm backside components are defined with a different part ID on the MpCCI server now.
  - Duplicated part names will be automatically suffixed with the part ID.
  - The following part types are accepted for the coupling:
    * STANDARD: standard two sided part, standard (1-Layer) insulated part.
    * MULTILAYER: multilayer part.
    * HIGH_CONDUCTIVE: high conductive part.
    * ENGINE: engine part.
    * face for backward compatibility reason.

2.10.12 STAR-CCM+

- Support of STAR-CCM+ 6.04.016, STAR-CCM+ 6.06.011, STAR-CCM+ 6.06.017 release.
- The STAR-CCM+ 5.0x releases are not supported anymore.
- Fix for retrieving STAR-CCM+ installation from Microsoft Windows registry.
- New additional option field to append additional user macro classpath. The user may provide his own java module beside the MpCCI STAR-CCM+ adapter module.
- Standard java macro scripts for coupling are provided within the MpCCI distribution. These are templates for standard steady state and transient implicit STAR-CCM+ simulation.
  The files are located under the directory `"codes/STAR--CCM+/adapters/macro"`.
  These macro files handle correctly an ABORT file and STAR-CCM+ will save the data.
- Adapter library:
  - When starting STAR-CCM+ with the graphical interface the adapter library defined in the macro file was not found. The setting of the user macro classpath has been fixed.

  - Fixed issue with boundary names containing ":". STAR-CCM+ table was not found.
  - Support for simulation model with preferred units system setting. User should set the same units system in the MpCCI GUI.
  - Support of 6-DOF model for FSI. The morpher will be set to 6-DOF plus displacement option instead of the standard option Total displacement. This feature is only available from the new STAR-CCM+ 6.04.014.
  - Memory usage improvement for the MpCCI STAR-CCM+ adapter for handling large models.
  - Additional new option for exporting the STAR-CCM+ boundary information to MpCCI. The default method is the export of the information in a single file instead of exporting individual files for each boundary.
  - STAR-CCM+ boundaries without element information are automatically removed from the coupled mesh definition.
  - Automatic definition of moving reference frames and moving grid parameters can be used in combination with a partner code having also supporting a mesh motion.

- Scanner changes:
  - Scanner will not list regions without physics continuum attached.
  - Duplicated boundaries from the same region are listed only one time. The duplicated boundaries are remembered in the scanner result file.
    It is recommended to use different names for each boundary. MpCCI scanner works in a case insensitive way.

2.10.13 STAR-CD

- Support of STAR-CD 4.16.010 for Windows and Linux platforms.
- The PGF90 releases of STAR-CD 4.x for Linux 64 platform are not supported anymore.
- Fix for STAR-CD on Microsoft Windows architecture:
  The MpCCI plugin for STAR-CD could not be correctly loaded if STAR-CD was installed in a directory containing white spaces.
- A user who wants to use the displaced nodal coordinates from MpCCI in the newxyz.f routine for another morphing step or grid movement calculation like a valve motion has met the following runtime issue:

  ```
  libstarusr.so: undefined symbol: starmpcci_newxyz_
  ```

  MpCCI copies the required library at the start of the STAR-CD calculation if required.
- ".ccmg" was not properly converted for the MpCCI Grid Morpher.

3 Changes and New Features in the Earlier Releases

3.1 MpCCI 4.1.1-2

3.1.1 MpCCI Environment

- Timeout connection has been increased for supporting large parallel applications connecting to the MpCCI server. The MpCCI client library has been updated.
- Bug fix for the update command `mpcci update` to download the new files.

3.1.2 Code Specific Changes

All code adapters include the connection timeout change.

Abaqus

- The MpCCI client library for Abaqus has to be updated. Please follow the installation procedure described for Abaqus in section 3.3.4. This includes the fixes of the following items:
  - The `bad hello string` message from the MpCCI server.
  - If `END=SS` is chosen in the Abaqus step definition, the step ends after this time period or when steady-state conditions are reached. Abaqus will properly quit the MpCCI server and does not terminate the complete coupled job.

FLUENT

- Issue with parallel FLUENT connections to the MpCCI server has been solved. FLUENT has received a connection timeout message during the initialization.

MSC.Marc

- MSC.Marc 2007r1 support on Microsoft Windows 32 bit has been dropped.

3.2 MpCCI 4.1.1-1

3.2.1 Coupling Server

- In case of a client connection with an invalid job identifier to the MpCCI server, the client process is now correctly informed and disconnected.
- When the MpCCI server was started on a remote machine, the listening port number may be wrong and the client codes may not connect to the right MpCCI server. This issue has been fixed.

3.2.2 MpCCI Environment

- Bug fix for the update command `mpcci update` to download the new files.

3.2.3 MpCCI Visualizer and MpCCI Monitor

- New feature available: show peaks function enables to display the location of the minimum and maximum value on the model.
- Bug fix: A connection to a host did not time out correctly.

3.2.4 Batch System

- Bug fix: By submitting a coupled job from the command line, the submit script was not correctly generated. For example:
  `mpcci batch SGE submit -pe parallel 4 -q coupled -cwd coupled.csp`

3.2.5 Code Specific Changes

ANSYS

- Add AIX platform support for ANSYS.

FINE/Turbo

- Support of FINE/Turbo 8.9-1 release.
- Automatic model preparation for the coupled simulation:
  - automatic activation of the coupled region.
  - direct specification of the hosts for a parallel run.

FINE/Hexa

- Support of FINE/Hexa 2.11-0 release.
- Automatic model preparation for the coupled simulation:
  - automatic activation of the coupled region.
  - direct specification of the hosts for a parallel run.

STAR-CCM+

- Support of STAR-CCM+ 6.02 release.
- Changes in the tutorial macro file: the run() command may in some cases not run as expected. This has been replaced by the equivalent command step().
- Code adapter does additional checks on the model setup. For example the boundary type and option are checked.

STAR-CD

- Support of STAR-CD 4.14.x release on Microsoft Windows, Linux platform. To use STAR-CD under Microsoft Windows, please set the `STARDIR` to the current STAR-CD installation to use, for example:
  `set STARDIR=C:/Program Files/CD-adapco/STAR-CD/4.14.014`

3.3 MpCCI 4.1.0-2

3.3.1 Coupling Server

- The MpCCI server is only using one port for the client connections from the simulation codes and the MpCCI Monitor.
- The command `mpcci server` has modified the option -port to -listen.

3.3.2 MpCCI Environment

- MpCCI detects the next available port for the MpCCI server and MpCCI Monitor process. The user can suggest a port number to be used from MpCCI GUI.

3.3.3 MpCCI GUI

- Improvement of the memory usage.

3.3.4 Code Specific Changes

Abaqus

- The start of Abaqus is stopped if the user did not define a time step size to exchange between the codes or define a constant time step to use for the coupling.
  In the previous release a default time step size of 0.1 was used if none of the both options was activated.
- If the option run until steady state is activated in Abaqus input deck, Abaqus has normally terminated but did send a fatal error to the MpCCI server. This has consequently terminated the full coupled simulation. A new Abaqus client lib is delivered within this patch and you have to follow this installation procedure:

ANSYS

- Fix issue for getting the appropriate initial action value in the APDL script.

Flowmaster

- Fix for Flowmaster adapter on Microsoft Windows 64 bit.

OpenFOAM

- Activate a call to data transfer before the execution of the solver.

STAR-CCM+

- Fix remeshing module using the coupled regions remeshing method.
- Fix for 2D FSI problem model.
- Fix for detecting new STAR-CCM+ release (>5.06) on Microsoft Windows platform.

Abaqus client library installation procedure:
First make a backup of the MpCCI client library you find under the directory:
"ABAQUS_INST/ABAQUS_RELEASE/External".
The MpCCI client library begins with the prefix "libmpcci". The new MpCCI client library may be found under the MpCCI installation directory:
"MPCCI_HOME/codes/Abaqus/lib/<ABAQUS_ARCH>".
Please copy the "libmpcci-XXX.[dll|sl|so]" to "ABAQUS_INST/ABAQUS_RELEASE/External" directory .

Platform/Processor	Directory name	MpCCI client library
Windows/x86-32	win86-32	libmpcci-vc80-32.dll
Windows/x86-64	win86-64	libmpcci-vc80-64.dll
Linux/x86-64	lnx86-64	libmpcci-64.so
HP-UX/Itanium	hpux1123_ia64	libmpcci-64.sl
AIX/Power	aix51_power	libmpcci-64.so

3.4 MpCCI 4.1.0-1

3.4.1 MpCCI Licensing

- New FlexNet Publisher license server updated to version 11.6. The user needs to upgrade the MpCCI license file and the license server.

3.4.2 MpCCI Platforms

- Support of Windows 7 32 and 64 bit platform.
- Support of Mac OS X (Darwin 10) 64 bit platform.
- OSF Alpha osf_alpha platform is no longer supported.
- Linux Itanium linux_ia64 platform is no longer supported.

3.4.3 Coupling Server

- The quantity values for orphaned nodes can be extrapolated by using a diffusion method.
- A coupled simulation can be monitored in parallel by several MpCCI Monitor processes. The MpCCI Monitor may (dis)connect with the MpCCI server at any time.
- Support of the EnSight Gold file format for the MpCCI tracefile.
- CCVX file support in case of simulation restarts. By restarting a coupled simulation with the same job name, a new cccvx file will be created with the next available index number. The MpCCI Visualizer will automatically read all the ".ccvx" files in case of a series of numbered files.
- Polyhedra elements are automatically converted into basic element types if possible.
- Additional element types QUAD12, QUAD16, TRIA10.

- Communication protocol between the server and client has changed. The in-house code needs to use the new MpCCI client library.

3.4.4 MpCCI API

- Extension of the code specific information `MPCCI_CINFO` in order to support future applications with the coupling server. (▷ VIII-2.9.7 Code Specific Information: `MPCCI_CINFO` ◁)
- Extension of the `MPCCI_PART` data structure. The macro `MPCCI_PART_AUXP(part)` has been replaced by the macro `MPCCI_PART_USRPTR0(part)` offering an access to a memory storage for a user pointer. The `MPCCI_PART` data structure has been extended with an additional user pointer list and the user can assign its own mesh information in the flags and state fields of the `MPCCI_PART` data structure for an own usage. (▷ VIII-2.9.8 Coupling Components ◁)

3.4.5 MpCCI Environment

- MpCCI provides a perl installation script for the Multi-platform download.

3.4.6 MpCCI Visualizer and MpCCI Monitor

- The user may open a CCVX file from the MpCCI Visualizer. This file may be located on the local machine or on a remote machine.
- The user may monitor a coupled simulation using the MpCCI Monitor. A Connect to host menu enables the user to enter the MpCCI server host and port number.
- MpCCI Visualizer can read compressed CCVX.GZ files.
- Animated GIF files can be exported.

3.4.7 Batch System

- Support of Microsoft Windows HPC batch system. An MpCCI coupled simulation can be set up on the Microsoft Windows HPC head node and submitted to the job scheduler.

3.4.8 MpCCI GUI

- New 0-dimensional Point elements and Integration Point elements for components can be coupled.
- The coupling of components with different dimensions is enabled. This means that components of one code with dimension x can be coupled with components of dimension y from another code. Quantities can only be sent from components with the higher dimension (see ▷ V-4.4 Coupling Step ◁).
- The setting of the default value for a quantity will now be set on the receiver side but only for global variables the default setting remains at the sender.
- The name of the backup file when converting an old project file changed to `"*.csp.bak000"` where 000 will be continuously incremented.
- Components found by the scanner which have no type associated in the `"gui.xcf"` will be ignored.
- Panels without components won't be listed in Coupling and Monitor Step anymore.
- The format of `"gui.xcf"` changed for associating quantities with component dimensions (see ▷ VIII-2.4.4 Component Types: `<ComponentTypeDimensions>` ◁).

3.4.9 Code Specific Changes

Abaqus

- Supported quantities list has been updated.
- Fix for Microsoft Windows platform to figure out information about the Abaqus installation by using the `PATH` variable if the Abaqus registry information is not available.
- Abaqus 6.10 needs to update the MpCCI client library in order to be compatible with MpCCI 4.1. First make a backup of the MpCCI client library you find under the directory: `"ABAQUS_INST/ABAQUS_RELEASE/External"`.
  The MpCCI client library begins with the prefix `"libmpcci"`. The new MpCCI client library may be found under the MpCCI installation directory:
  `"MPCCI_HOME/codes/Abaqus/lib/<ABAQUS_ARCH>"`.
  Please copy the `"libmpcci-XXX.[dll|sl|so]"` to `"ABAQUS_INST/ABAQUS_RELEASE/External"` directory .

Platform/Processor	Directory name	MpCCI client library
Windows/x86-32	win86-32	libmpcci-vc80-32.dll
Windows/x86-64	win86-64	libmpcci-vc80-64.dll
Linux/x86-64	lnx86-64	libmpcci-64.so
HP-UX/Itanium	hpux1123_ia64	libmpcci-64.sl
AIX/Power	aix51_power	libmpcci-64.so

ANSYS

- Support of ANSYS 13.0 release.

FLUENT

- Support of FLUENT 13.0 release.
- The quantity mass flow rate (MassFlowRate) can be received on a mass flow inlet boundary. The user has to change the Mass Flow Specification Method to Mass Flow Rate in the boundary conditions panel.
  This is a feature available up to FLUENT 13.
- Fix for thermal coupling with Euler multiphase model.
- Fix for time step subcycling option: the nodal coordinates were updated at each time step.
- Fix for setting the User-Defined Time Step in case of using a volume of fluid model.
- Fix for running FLUENT in parallel under Microsoft Windows system. FLUENT installation path is specified as UNC format only if this one is defined on the system.
- MpCCI libudf is now always copied to the FLUENT working directory avoiding compatibility issue when the user is changing a FLUENT release or if the user has upgraded its MpCCI installation.
- Extend the search of the FLUENT installation on Microsoft Windows machine. MpCCI is additionally checking the desktop shortcuts for locating any FLUENT installation.

Flowmaster

- An applied thermal boundary condition on a pressure was not taken into account for the Flowmaster calculation. A patch is available from Flowmaster for the thermal coupling with pressure source

component and has to be requested. The installation needs some support in order to reconfigure the co-simulation environment for Flowmaster.

ANSYS Icepak

- Support of ANSYS Icepak 13.0 release.

MD NASTRAN

- Additional support for MD NASTRAN 2010.1.3 release which is recognized as MD NASTRAN 2010.1 release by MpCCI.
- Fix for receiving the time step quantity.

MSC.Marc

- Support of MSC.Marc 2010 release.
- The MpCCI MSC.Marc adapter architecture naming convention has changed. For all MSC.Marc releases, the MSC.Marc 2010 platform naming convention will be used. It does not affect the usage of the MSC.Marc application.
- MSC.Marc executable will only be compiled once for the job if there are changes in the FORTRAN user routines or MpCCI adapter library.
- Modification of the data exchange sequence. MSC.Marc exchanges data at the start of the increment. It allows MSC.Marc to receive the time step quantity.

OpenFOAM

- Support of OpenFOAM 1.5 and higher for Linux and Windows 64 bit platforms.
- Support 3D model application for FSI and thermal coupling calculation.
- Volume coupling is currently not supported.

RadTherm

- Support of RadTherm 10.0 release

STAR-CCM+

- No support for STAR-CCM+ 4.06.011.
- Support of STAR-CCM+ 5.06.010.
- Fix for boundary names having trailing white space. Under Microsoft Windows the definition of the coupled mesh had failed.
- The quantity mass flow rate (MassFlowRate) can be received on mass flow inlet boundary type. That quantity will be converted into a mass flux rate for the boundary on STAR-CCM+ side for the coupling.
- Fix for receiving quantity Temperature on mass flow inlet boundary type.

- Fixed bug in the memory management in case of large models. STAR-CCM+ got a java heap memory error in case of surfaces with more than a million elements and a number of nodes over two millions.

- Added a remeshing module configuration for fluid structure interaction problem (▷ VI-15.2.5.2 MpCCI remeshing module ◁). User can set up in the MpCCI GUI the criteria for remeshing process. This module is only activated if the NPosition quantity is exchanged.

STAR-CD

- The quantity mass flow rate (MassFlowRate) can be received.

3.5 MpCCI 4.0.1-4

3.5.1 Code Specific Changes

FLUENT

- Fix force computation on a coupled wall having a shadow wall.

3.6 MpCCI 4.0.1-3

3.6.1 Coupling Server

- Fix for the coupling server on Windows Vista 32 and 64 bit platform.

  – The issue affect the mapping of flux density or integral based quantity. For such quantity type (e.g. WallForce, RelWallForce, AbsPressure, OverPressure,...) the integration of the value on the target mesh was not correct and introduced errors in the computation of mesh deformation.

  – The following MpCCI 4.0.1-1 and MpCCI 4.0.1-2 releases were affected.

  – It indirectly affects Windows 7, since Windows 7 falls back onto Vista if this installation exits.

3.6.2 MpCCI Environment

- Possibility to set the license check time out value by setting the environment variable `MPCCI_LICENSE_TIMEOUT`.
  In case where the user get a license timeout, the user can increase that value (the default value is 30 seconds) by setting this environment variable. It may happen by using ANSYS or during the start of the MpCCI GUI where the MpCCI license availability is checked.

3.6.3 Code Specific Changes

ANSYS

- Fix the ANSYS product license features listing:
  Although the command `mpcci ANSYS -products` returns some product features, some users get an additional warning that no valid license was found as below:

```
> mpcci ANSYS -products
mpcci ANSYS products:
  No valid license files or servers found.
ane3fl
ansys
struct
```

ANSYS product license features settings is configured with the following order:

1. `ANSYSLMD_LICENSE_FILE`: can be used to identify one or several license server machine(s) or license file(s).
   This setting must refer to the FLEXlm server setting and not to the ANSYS Licensing Interconnect port.
2. `ANSYSLIC_DIR`: can be used to specify the path to the license file `"license.dat"`
3. Additionally the ANSYS default license port 1055 will be checked if no license features were previously found and if the default port was not already checked.

MD NASTRAN

- Add an option for saving the .f04, f06,... files.
- Add Elastic Flap tutorial (▷ VII-3 Elastic Flap in a Duct ◁).

STAR-CCM+

- Defect concerning a missing MpCCI client shared library under Microsoft Windows:
  the adapter library can now find the MpCCI client dynamic library. User does not have to set in the java macro file the environment variable `_MPCCI_LIBPATH`.
- Remove the need to set in the java macro file the environment variable referring the MpCCI client library:

```
static {
    String mpcciLibPath = System.getenv("_MPCCI_LIBPATH");
    System.setProperty("jna.library.path", mpcciLibPath);
}
```

All java macro files from the tutorial have been updated according to the previous usability improvement.

3.7 MpCCI 4.0.1-2

3.7.1 MpCCI Environment

- Improve error message for the utility accessing the Microsoft Windows registry database.

3.7.2 Code Specific Changes

FLUENT

- FLUENT 12.1.4 adapters for Linux 32 and 64 bit.

MD NASTRAN

- Adapters for MD NASTRAN 2009 is removed from the support list.
- Adapters for supporting MD NASTRAN 2010 (CL72204).

STAR-CCM+

- Fix for Perl Info Module running under windows 64 bit.

3.8 MpCCI 4.0.1-1

3.8.1 Coupling Server

Platform linux_em64t

- This Linux platform requires at least a glibc version 2.5, gcc version 4.1.2. Otherwise you may get a floating point exception by starting the server. In that case you can switch the `MPCCI_ARCH` to linux_amd64.

Termination message

- Improved the termination of the server in case that only one code is still connected. The server checks if the other code is still active before closing the connection.
- Improved the automatic the neighborhood parameters setting.

Bounding Box

- The server write a tracefile in case of a bounding box error. A writer has to be activated in order to get that file.

Orphans nodes information

- The orphans information is just available on the receiver side.

3.8.2 MpCCI Visualizer

- Possibility to read compressed `".ccvx.gz"` file.
- Bug fix for coloring the vectors by the active scalar which is the default option.
- Bug fix for dialog boxes which lost the window focus. Avoid the MpCCI Visualizer to freeze.

3.8.3 Batch System

- Improved code/resource allocation method: available resources are distributed to the code having the most processes/CPU requested.
- The option -port for the `mpcci batch` command was ignored if the port number was out of the range defined in the server MpCCI GUI configuration file. Limitation has been removed.
- Enable the start of the MpCCI GUI on an interactive batch queue session by activating the environment variable `MPCCI_IBATCH`.

3.8.4 MpCCI GUI

- MpCCI project file ".csp" version has changed. The old project will be automatically converted.
- Detection of an incompatible setting for the Quantities Initial Transfer option. All codes could not start with the option receive.
- Automatic verification of the validity of the monitor host provided.
- Show the MpCCI server output in case of using no xterm in the information or error dialog.

3.8.5 Code Specific Changes

Abaqus

- Abaqus 6.10 is supported.
- Abaqus scanner recognized the solution type (static or transient) for heat transfer, coupled analysis type.

ANSYS

- ANSYS 11.0 sun64 platform has been removed and replaced by usIII. If ANSYS sun64 adapter is needed, copy the adapter directory usIII to sun64.
- ANSYS 12.1 is supported.
- Model dimension bug fix (for model that is just created on the X-Y plane).

FLUENT

- FLUENT 12.1 is supported.
- Activate the At-Exit hook in order to properly disconnect FLUENT to MpCCI server.
- Fixes for MpCCI Control Panel in FLUENT. Some options were not correctly updated.
- bug fix: FLUENT do not seems to be terminated by MpCCI by clicking on the kill button (mostly for FLUENT serial computation).
- Fix issue with the Update Steady Mesh which was not correctly called.

MD NASTRAN

- Current adapters are available for MD NASTRAN 2010.
- Fix for detecting MD NASTRAN installation for MD NASTRAN 2010.
- MpCCI Code Manual for MD NASTRAN is available.

MSC.Marc

- MSC.Marc 2005r3 support has been removed.

RadTherm

- RadTherm 9.3 is supported.

- Fix missing dll files for scanning the RadTherm model for Microsoft Windows platform.

STAR-CCM+

- STAR-CCM+ 4.04.001, 4.06.011, 5.02.009, 5.02.010 are supported.
- Tutorial examples have been added.

STAR-CD

- STAR-CD 4.12.004, 4.12.016 releases are supported.

3.9 MpCCI 4.0.0-1

3.9.1 Coupling Server

Termination message

- Deadlock issue when the simulation end time is reached:
  The server will terminate gracefully with a normal exit code.

Parallel Client Connection

- Solve issue with concurrency incoming connections on the server when running parallel codes on some platforms.

3.9.2 MpCCI Visualizer

- Fixed crash when using -updatedelay and changing number of parts in the last received time step.
- Fixed bug with the vectors not colored by the selected scalar value if vectors are enabled before the scalar result.
- Fixed bug with monitor running over night and not showing the model anymore.

3.9.3 Batch System

- Extend support of SGE version 6.2 environment.
- Add option -port for the `mpcci batch` command to specify an alternative port for the communication between the MpCCI server and the clients.
- Add an optional user environment variable `MPCCI_IBATCH` to force a job running in an interactive on a batch queuing system. Setting this variable to 1 disable the batch system detection.

3.9.4 MpCCI GUI

- Fixed bug when reading a project file set with 3 codes. Quantity settings are correctly restored.
- Fixed bug when using the self coupling feature. Sometime the code id was not correctly generated.

3.9.5 Code Specific Changes

ANSYS

- The scanner output information changed for
  - supporting usage of mixed element type for a component definition,
  - simplifying the integration of new element type for the coupling.
- ANSYS user manual provides information on how to predefined loads on dummy surface elements.


ANSYS model file has to be rescanned by using the Force rescan option

STAR-CD

- STAR-CD 4.10.008 is supported.

3.10 MpCCI 4.0.0-0

3.10.1 Installation, Configuration and Licensing

Installation

Users who have yet to upgrade to MpCCI 4.0 should install MpCCI in a new directory.

Licensing

Users will need an appropriate license file to access MpCCI 4.0.

MPICH

MpCCI 4.0 does not need any MPI installation anymore. Microsoft Windows MPICH installation could be removed.

3.10.2 Coupling Server

Improved Performance

The MpCCI 4.0 coupling server based on a new design offers

- A fast and robust mapping method.
- A support of advanced simulation application through flexible coupling schemes.
- A reduced memory usage and CPU load.
- Support of remeshing of coupling surfaces or volumes at runtime.
- Trace files in various formats.

Quantity configuration

- Ramping and under-relaxation per quantity.
- Quantity is defined per mesh which allows them to be *sent and received* on different parts.

Interpolation Schemes

- Support of new element types:
  - quadratic elements
  - axisymmetric elements
  - polygons and polyhedra
- Coupling between network and mesh-based codes.
- Fast and robust interpolation based on shape function.

Flexible Coupling Schemes

The coupling server supports

- An asynchronous buffered coupling communication.
- Coupling on demand.

Trace Files in various Formats.

- Support of various visualizers (Ceetron, Paraview, etc.)

3.10.3 MpCCI Visualizer

Under Microsoft Windows and Linux MpCCI now offers a new viewer for its tracefiles. The new viewer is automatically started by `mpcci vis` if available (see ▷ 5 Supported Platforms in MpCCI 4.2 ◁). The new format is `".ccvx"`.
The MpCCI visualizer is also used as monitoring process. MpCCI GUI allows to enable the online monitoring feature and to access the coupled quantity during the simulation.
For more information the new viewer provides an online documentation.

3.10.4 MpCCI GUI

A New Monitor Step

MpCCI GUI is now offering the possibility to select some additional components that will not be coupled during the simulation. These components may be visualized with the available quantities provided by MpCCI GUI.

3.10.5 Code Specific Changes

Abaqus

- MpCCI 4.0 is not compatible with the current Abaqus 6.9-1 release. The next Abaqus release should be compatible with MpCCI. Please contact MpCCI for details.

ANSYS

- ANSYS 11.0 and ANSYS 12.0 are supported.
- The `~mpcci` command changed (see ▷ VI-3 ANSYS ◁).

Flowmaster

- Flowmaster 7.6 is supported.

FLUENT

- FLUENT 6.3.26 and FLUENT 12.0.16 are supported.
- Remeshing and reallocation/migration of nodes which can be handled by MpCCI.

FLUX

- FLUX 10.2 and FLUX 10.3 beta are supported.

ANSYS Icepak

- ANSYS Icepak 4.4.6 to FLUENT 6.3.34 and ANSYS Icepak 4.4.8 corresponds to FLUENT 6.3.36 are supported.
- The adapter solution is derived from the standard FLUENT adapters for these versions.

MD NASTRAN

- MD NASTRAN 2009 is supported.
- Only Fluid-Structure application is enabled with MD NASTRAN.

MSC.Marc

- MSC.Marc 2005r3, MSC.Marc 2007r1, MSC.Marc 2008r1 are supported.
- Parallel MSC.Marc computation is supported.
- Axisymmetric model is supported.

PERMAS

- PERMAS is currently not compatible with MpCCI 4.0.

RadTherm

- RadTherm 9.1.0, RadTherm 9.1.2, RadTherm 9.2.0 are supported.

STAR-CD

- STAR-CD 3.26 is not supported.
- STAR-CD 4.06.007, STAR-CD 4.08.006 are supported.

4 Prerequisites for MpCCI Installation

Please see ▷ 5 Supported Platforms in MpCCI 4.2 ◁ for platform-specific prerequisites.

Required Disc Space

A full MpCCI installation (all platforms and all code adapters, plus a multi-platform Java JRE and the MpCCI-RSH and the OpenSSH for Microsoft Windows) requires a free disc space of approx. 1.0 GB.

Third Party Software

Perl

Java

MpCCI-RSH for Windows is provided by MpCCI. This allows an access to all Windows operating system XP and Vista (See ▷ III-2.6 MpCCI-RSH for Microsoft Windows ◁).

5 Supported Platforms in MpCCI 4.2

Platform lists for supported simulation codes are given in the Codes Manual.

5.1 Platforms Supported by the MpCCI 4.2 Server

Platform	Bits	MpCCI arch.	Support
Apple Mac OSX on Intel 64 Bit	64	macosx_intel64	OK, no visualizer
HP-UX 11.00 on PA-RISC	32/64	hpux11_parisc	OK, no visualizer
HP-UX 11.22 on Itanium I	64	hpux1122_ia64	*not supported*
HP-UX 11.23 on Itanium II	64	hpux1123_ia64	OK, no visualizer
IBM AIX 5.1 on Power3 processor	32/64	aix51_power	OK, no visualizer
IBM AIX 5.2 on Power3 processor	32/64	aix52_power	use aix51_power
IBM AIX 5.3 on Power3 processor	32/64	aix53_power	use aix51_power
IBM AIX 6.1 on Power3 processor	32/64	aix61_power	use aix51_power
Linux with glibc 2.3 on AMD64 or EM64T processor	32/64	lnx3_x64	OK
Linux with glibc 2.3 on Itanium	64	lnx3_ia64	use lnx3_x86
Linux with glibc 2.3 on x86	32	lnx3_x86	OK
Linux with glibc 2.4 on AMD64 or EM64T processor	32/64	lnx4_x64	OK
Microsoft Windows 32 bit on AMD/Intel	32	windows_x86	OK
Microsoft Windows 64 bit on AMD/Intel	32/64	windows_x64	OK
OSF1 V5.1 with Alpha processor	64	osf_alpha	*not supported*
SGI IRIX64 6.5 on R10000	32/64	irix65_mips4	*not supported*
SUN Solaris >= 2.7 on AMD64 compatible processor	32/64	solaris_amd64	*not supported*
SUN Solaris >= 2.7 on Sparc processor	64	solaris_sparc	OK, no visualizer
SUN Solaris >= 2.7 on X86 compatible processor	32	solaris_x86	*not supported*

The above list is valid for MpCCI alone, i. e. the MpCCI executables. This does not automatically include all code adapters. Some simulation codes can only be coupled on a subset of the above platforms. A list of platforms for the supported codes is given in the following section and for each code in the corresponding chapter of the Codes Manual.

5.2 Codes Supported by MpCCI 4.2 on Different Platforms

Codes can only be supported on platforms they support themselves.

Apple Mac OSX on Intel 64 Bit (`macosx_intel64`)

OpenFOAM	1.7

HP-UX 11.00 on PA-RISC (`hpux11_parisc`)

ANSYS	110, 120, 121, 130, 140
FLUENT	12.0.16, 12.1.2
MSC.Marc	2008r1, 2010
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0

HP-UX 11.23 on Itanium II (`hpux1123_ia64`)

ANSYS	110, 120, 121, 130, 140
FLUENT	12.0.16, 12.1.2, 13.0.0
ANSYS Icepak	13.0.0
MSC.Marc	2007r1, 2008r1, 2010, 2011

IBM AIX 5.1 on Power3 processor (`aix51_power`)

FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.2, 13.0.0
ANSYS Icepak	13.0.0
MD NASTRAN	2010.1
MSC.Marc	2008r1, 2010, 2011
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CD	4.06.007, 4.08.006, 4.10.008, 4.12.003, 4.12.015

Linux with glibc 2.3 on AMD64 or EM64T processor (`lnx3_x64`)

ANSYS	110, 120, 121, 130, 140
Abaqus	6.12-1
FINE/Hexa	210_4
FINE/Open	211_1, 211_2, 211_3
FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.2, 12.1.4, 13.0.0
ANSYS Icepak	13.0.0, 14.0.0
MD NASTRAN	2010.1, 2011.1, 2012.1
MSC.Marc	2007r1, 2008r1, 2010, 2011
OpenFOAM	1.5, 1.6, 1.7
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CCM+	6.02.007, 6.02.009, 6.04.014, 6.04.016, 6.06.011, 6.06.017
STAR-CD	4.06.007, 4.08.006, 4.10.008, 4.12.003, 4.12.015, 4.14.011, 4.14.038, 4.16.010

Linux with glibc 2.3 on x86 (`lnx3_x86`)

ANSYS	110, 120, 121, 130, 140
FINE/Hexa	210_4
FINE/Open	211_1, 211_2, 211_3
FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.2, 12.1.4, 13.0.0
ANSYS Icepak	13.0.0
MD NASTRAN	2010.1, 2011.1, 2012.1
MSC.Marc	2007r1, 2008r1, 2010, 2011
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CCM+	6.02.007, 6.02.009, 6.04.014, 6.04.016, 6.06.011, 6.06.017
STAR-CD	4.06.007, 4.08.006, 4.10.008, 4.12.003, 4.12.015, 4.14.038, 4.16.010

Linux with glibc 2.4 on AMD64 or EM64T processor (`lnx4_x64`)

ANSYS	110, 120, 121, 130, 140
Abaqus	6.12-1
FINE/Hexa	210_4
FINE/Open	211_1, 211_2, 211_3
FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.2, 12.1.4, 13.0.0
ANSYS Icepak	13.0.0, 14.0.0
MD NASTRAN	2010.1, 2011.1, 2012.1
MSC.Marc	2007r1, 2008r1, 2010, 2011
OpenFOAM	1.5, 1.6, 1.7
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CCM+	6.02.007, 6.02.009, 6.04.014, 6.04.016, 6.06.011, 6.06.017
STAR-CD	4.06.007, 4.08.006, 4.10.008, 4.12.003, 4.12.015, 4.14.011, 4.14.038, 4.16.010

Microsoft Windows 32 bit on AMD/Intel (`windows_x86`)

ANSYS	110, 120, 121, 130, 140
Abaqus	6.12-1
FINE/Hexa	210_4
FINE/Open	211_1, 211_2, 211_3
FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.4, 13.0.0
FLUX	10.2, 10.3
Flowmaster	7.6, 7.7, 7.8, 8.0, 8.1
ANSYS Icepak	13.0.0, 14.0.0
MD NASTRAN	2010.1, 2011.1, 2012.1
MSC.Marc	2008r1, 2010, 2010.2, 2011
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CCM+	6.02.007, 6.02.009, 6.04.014, 6.04.016, 6.06.011, 6.06.017
STAR-CD	4.14.011, 4.14.038, 4.16.010

Microsoft Windows 64 bit on AMD/Intel (`windows_x64`)

ANSYS	110, 120, 121, 130, 140
Abaqus	6.12-1
FINE/Hexa	210_4
FINE/Open	211_1, 211_2, 211_3
FINE/Turbo	810_1, 89_1, 89_2, 89_3
FLUENT	12.0.16, 12.1.4, 13.0.0
FLUX	10.2, 10.3
Flowmaster	7.6, 7.7, 7.8, 8.0, 8.1
ANSYS Icepak	13.0.0, 14.0.0
MD NASTRAN	2010.1, 2011.1, 2012.1
MSC.Marc	2007r1, 2008r1, 2010, 2010.2, 2011
OpenFOAM	1.7
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CCM+	6.02.007, 6.02.009, 6.04.014, 6.04.016, 6.06.011, 6.06.017
STAR-CD	4.14.011, 4.14.038, 4.16.010

SUN Solaris >= 2.7 on Sparc processor (`solaris_sparc`)

ANSYS	110
FLUENT	12.0.16, 12.1.2
MSC.Marc	2007r1, 2008r1, 2010
RadTherm	10.0.0, 10.0.2, 10.1.0, 10.2.0
STAR-CD	4.06.007, 4.08.006

6 Known Bugs and Limitations in MpCCI 4.2

6.1 Codes

Abaqus

- Abaqus 6.10 model using SAX shell axisymmetric element type could not be coupled. Abaqus does not properly define the coordinate system to MpCCI server.
  You may find this following error message in the MpCCI server log file:

```
Found two meshes with identical ID 1 and 1 matching quantity,
but non matching coordinate system types:
   FLUENT/MESH-1: CSYS=AX
   Abaqus/MESH-1: CSYS=2D
```