TO DO for MODRIO V8

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## Tool environment

This is just a list of items we know that should be resolved in order to have a working tool environment for TLM co-simulation.

The list is with high probability not complete, more items will be discovered when the tools are further tested or used. It is important that significant effort is spent on using and testing the tools.

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| Task | Description | Who | Status | Expected  Date |
| Graphical 3D Alignment of Models | When building the model,.e., model correct nominal positions and orientations. This feature is needed in order to have physical correct models. Feedback to the user with 3-D graphics is extremely useful. This includes simple visualization of the coordinate systems that are available for TLM connection.  (Peter: not in the original MODRIO work plan, but useful) | ?? | 2 weeks |  |
| 3-D graphics | For model animation. Each external model have VRML or STL representation.  (Peter: not in the original MODRIO work plan, but useful) | ?? | 1 week |  |
| Solver one-step mode | Solver one-step mode in OpenModelica is needed to get accurate and efficient simulation. For the complete simulation of a particular tool process, the maximum time step, and error tolerances should give.  Willi : I discovered a bug and need to fix it. Also reported by Alexander.  Adrian will do more testing. | Willi, Adrian | Done | 2015-10-23 |
| Output control | Where you specify two conditions, frequency and time increment, i.e., with WriteThisOften and WriteTimeStep. Note, that the time increment condition is approximate, i.e., you don’t align with that time but check if you pass the time.  Adrian will do more testing. | Willi, Adrian | Done | 2015-10-23 |
| Wind power test case | Should run correctly with OpenModelica in 64-bit version on both Linux and Windows.  (Now 151009. Initialization issues remain. Adrian communicates with Lennart Ochel) | Adrian  (L Ochel) | 80%  1 week work? | 2016-03-01 |
| Safe termination | That all the simulation processes are taken down properly when the simulation is finished or if an error occur in one of the processes.  Adrian : will look at this. | Adeel,  Adrian | Done | 2016-04-14 |
| Manual, tutorial and help | A documentation for the tool environment should be created. | Alachew | 2 day | Beginning of March |
| Examples with different tools | e.g., OpenModelica, BEAST, etc. This will ensure that the tool package is general enough. | Alachew, Adrian | 1 week | End of March |
| Creation of External model files | When adding an external model to the Meta-Model all necessary files should be copied into a subdirectory with the name of the external model.  Adeel : It should work. I will check again.  2016-02-24 – is working now, checked | Adeel | Done |  |
| Retrieve interface name and position | From the different external models. Best would be to be able to do it one by one. Some implementation exists but does not work correctly. Some problems: Multiple requests will add the same interface multiple times. Not all interfaces are reported but only a subset. Interfaces do not show up in the TLM connection dialog.  Alachew : It should work. I will check again. | Alachew | Done |  |
| Editing of TLM connection parameters | It is not possible in the OMEdit parameters dialog. Values are shown but cannot be edited or are not updated in the Meta-Model. | Adeel | Done | 2016-03-29 |
| Editing of external model parameters | Does not work in the parameter dialog but only in the XML code.  Adeel : Ask Alexander & Dag what parameters should be changeable. Alachew will send an email. | Alachew | Done | 2016-03-09 |
| Automatic selection of network ports | This would simplify the co-simulation startup and monitoring.  Adeel : It should work. I will check again.  2016-02-24 – is working now, checked | Adeel | Done |  |
| Meta-Model renaming | There is a problem with Meta-Model renaming that needs to be resolved.  Alexander : Rename sub-models and save with new folder strucuture.  Adeel : Add save-as instead of renaming a meta-model. | Adeel | Done | 2016-02-08 |
| Graphical representations of TLM interfaces | Graphical representations of TLM interfaces in the Meta-Model are needed. Possibly with names attached for simplified modelling.  Adeel : Hard coded representation of interface point e.g an arrow. But with flexible positioning.  Adrian : Create enumeration for shapes and add it to the XML. Ask SKF people how they want it. | Adeel | Done | 2016-03-29 |
| Change icons for Meta-Models and external models | Change icons for Meta-Models and external models in OMEdit. This might require some annotations in the XML definition.  Adeel : Add option “change/update icon”in the meta-model editor. This should open a new widget which allow creating icon using Modelica shapes and then store the created Modelica graphical annotations in the meta-model XML.  Ask SKF people how they want it.  Adeel: Not Needed | Alachew | 2 weeks | Future |
| Start OMEdit with Meta-Model as command line parameter | Start OMEdit with Meta-Model as command line parameter does currently not work.  Adeel : Tested and is working fine.  2016-02-24 – is working now, checked | Adeel | Done |  |
| alignment of interfaces based on coordinate system | add the missing parts of the XML schema like global coordinate system, extra files, graphical data  + first version just check that they are aligned and display which ones are not aligned with some easy to spot graphical marker  + 2d graphical tool for alignment of interfaces select from, select to and transform in the global coordinate system  + 3d visualization of 3d data based on OSG  \* first version, just visualization of interfaces to see if they are aligned properly (3 arrows)  \* second version, load the graphical data and display that too  \* third version, select which interfaces should be aligned on the 3d level  Adeel : First & second version is done. You can select which interfaces to align and the editor also shows which interfaces are aligned and which are not aligned by marking them red. | Adrian, Alachew, Robert & Adeel |  | End of March |
| better failure handling | better failure handling, maybe based on closing of sockets | Adrian |  | Future |
| Modelica External Objects | Update the Modelica plugin code to use external objects instead of global static object.  2016-02-24 – is working now, checked | Adeel | Done | 2015-11-17 |
| FMI based TLM co-simulation | + we need a main FMU wrapper that can be started by the TLM Manager and which loads the FMU and talks with the TLM Manager  + we need to decide naming conventions to map between the TLM interface and the FMI interface  + first version, use the FMU as it is and implement  getForce, setMotion in the FMU wrapper which calls the existing FMI interface  + second version, extend the FMI standard with getForce, setMotion functions and doInternalStep  + check for FMI extensions for ports (Adrian)  Meeting between Robert & Adrian | Robert, Adeel, Adrian & Alachew |  | Future |