



Introduction to the Standard Running Environment (SRE)

of the Integrating Model & Data Infrastructure

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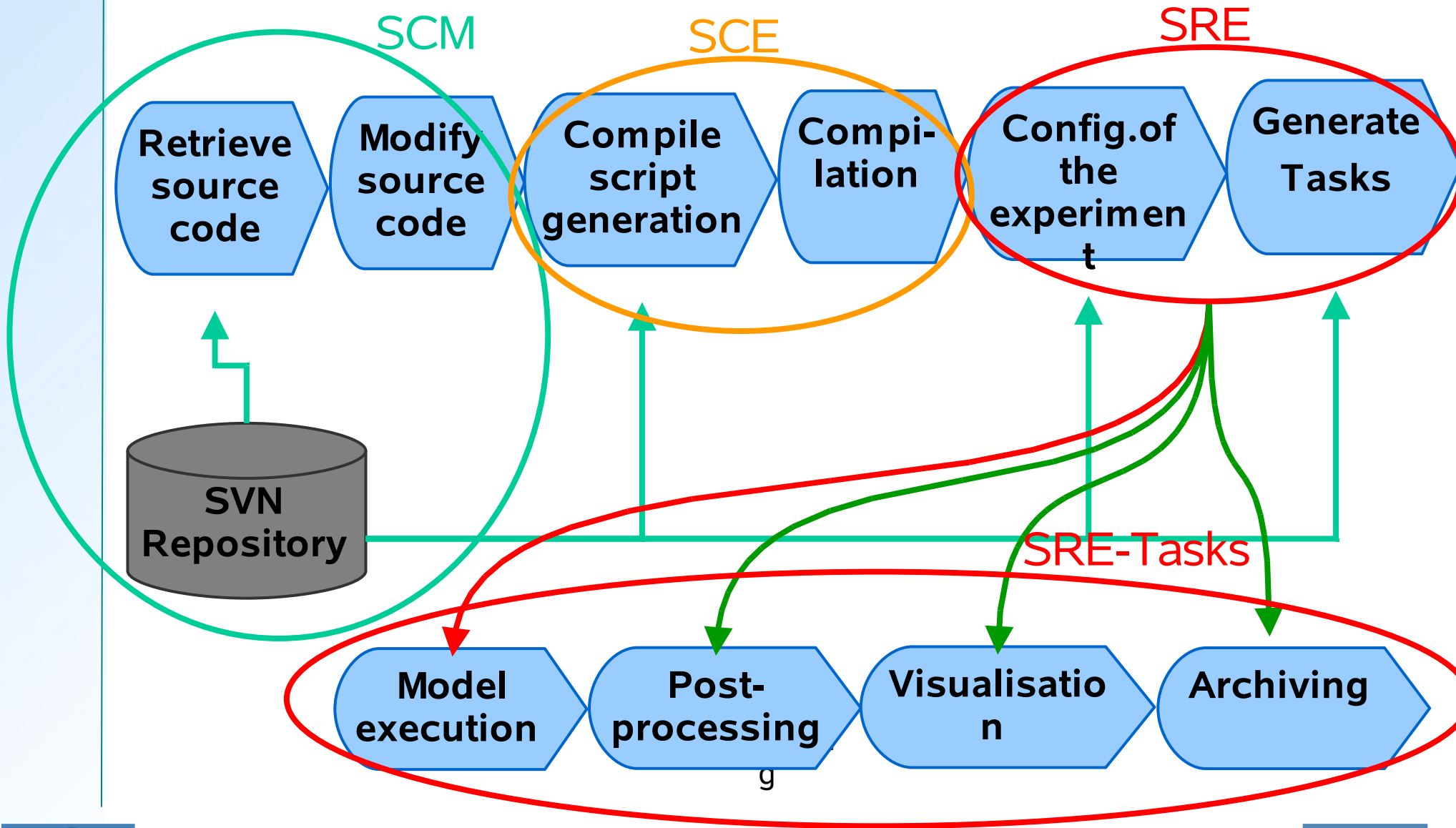


Outline

- Components of the SRE
- Standard Directory Structure of Experiments
- Generation of Tasks
- Running Environment
- SRE File Systems and DKRZ Computing Facilities
- Models and Platforms supported by SRE
- Benefits and Documentation



Experiment flow within IMDI



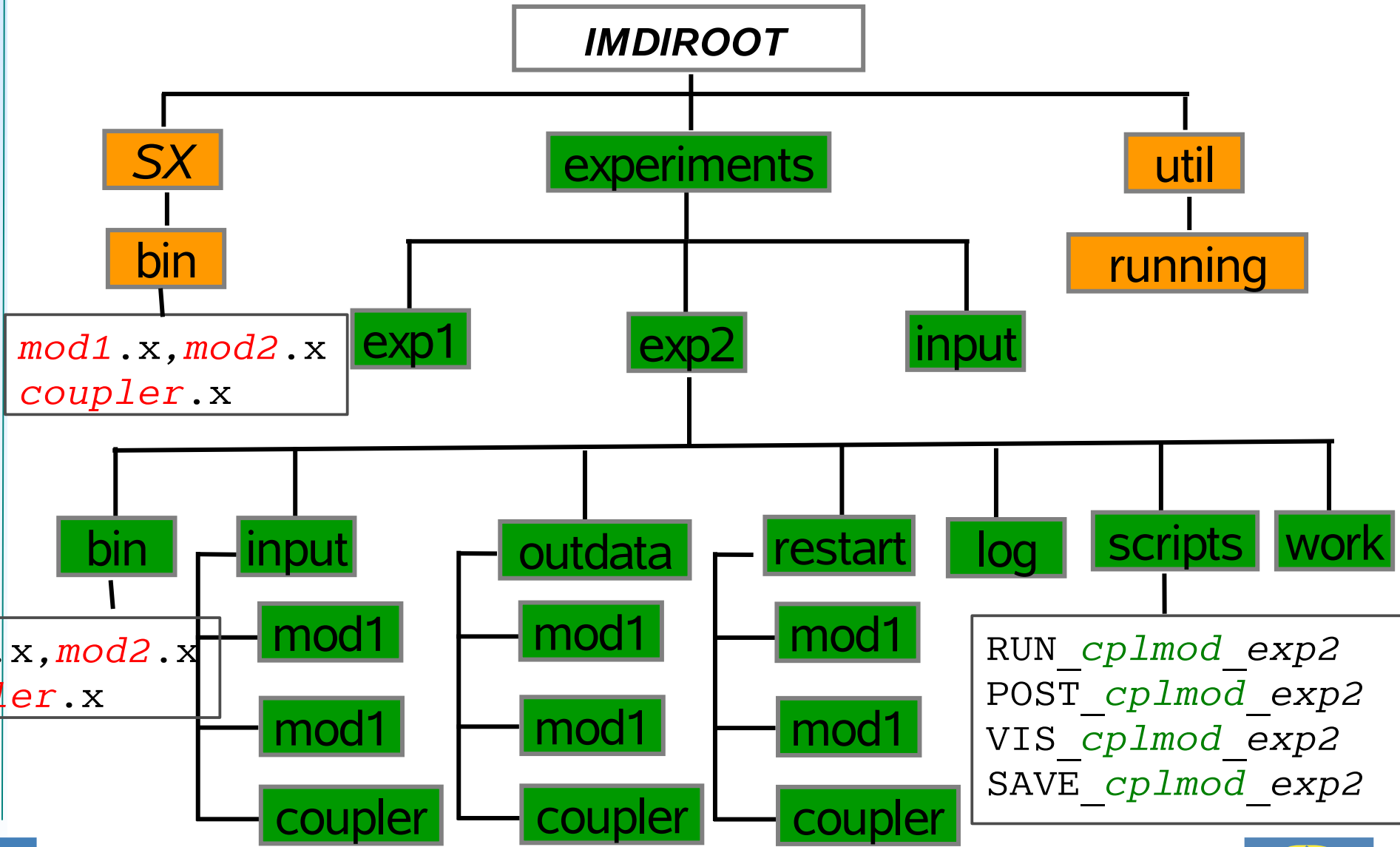


Components of SRE

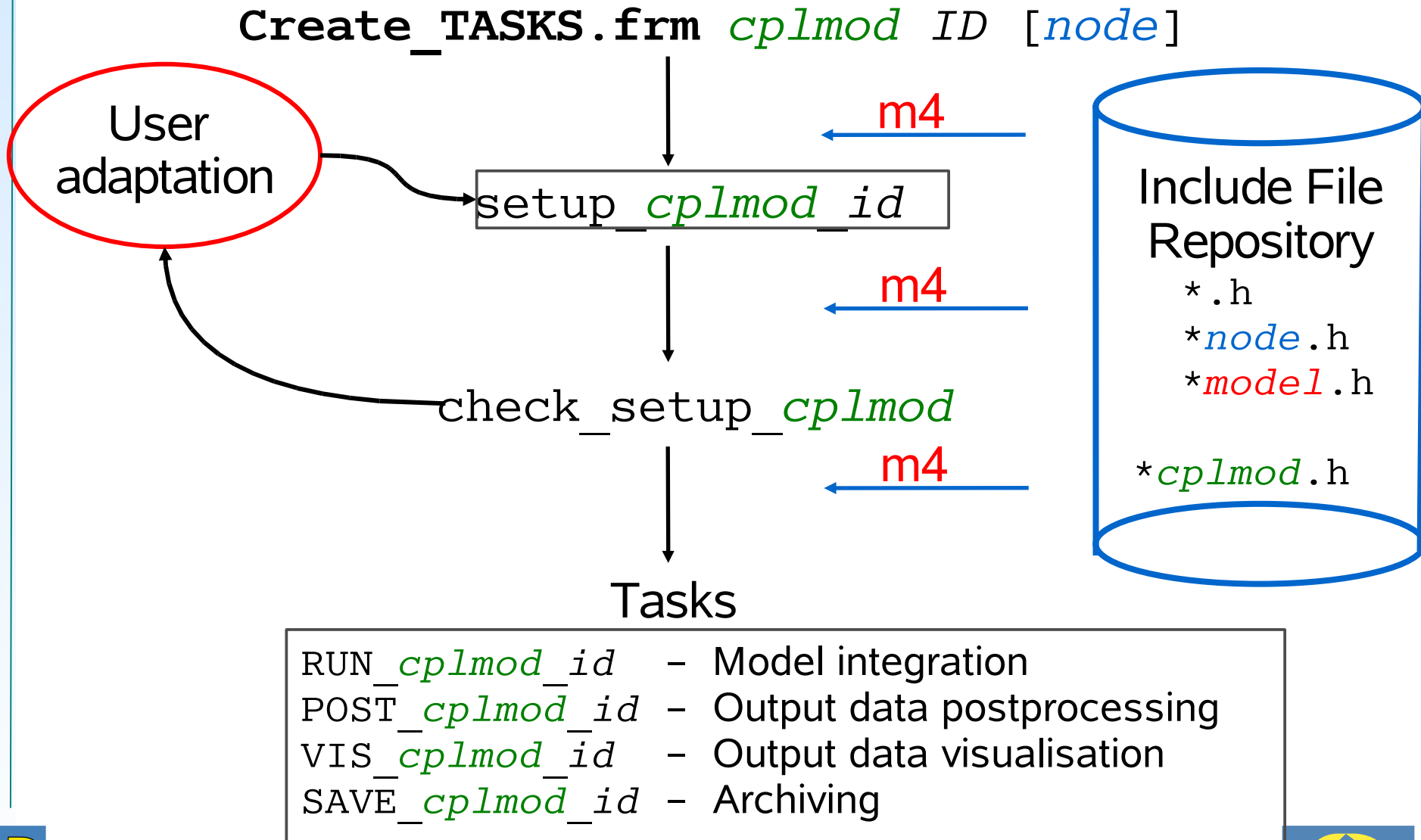
- Standardized directory structure
 - the executables (generated by SCE)
 - the input, output and restart files
 - tools for script generation
 - setup files for the experiment
 - directories to run the experiment
- m4 and ksh scripts to generate site and model specific scripts from a common base of header files for
 - model execution
 - post-processing, visualisation and archiving
- Computing and archiving facilities



SRE directory structure of 'experiments'



Generation of Tasks





The Running environment

Create_TASKS.frm *cplmod ID*

Tasks

- RUN_cplmod_ID
- POST_cplmod_ID
- VIS_cplmod_ID
- SAVE_cplmod_ID

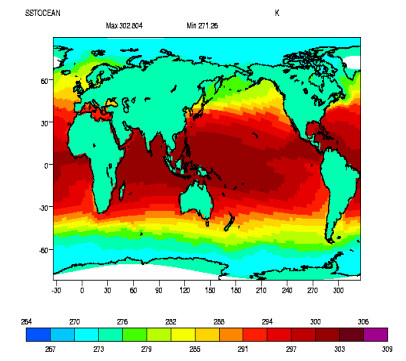
executables

model execution

postprocessing

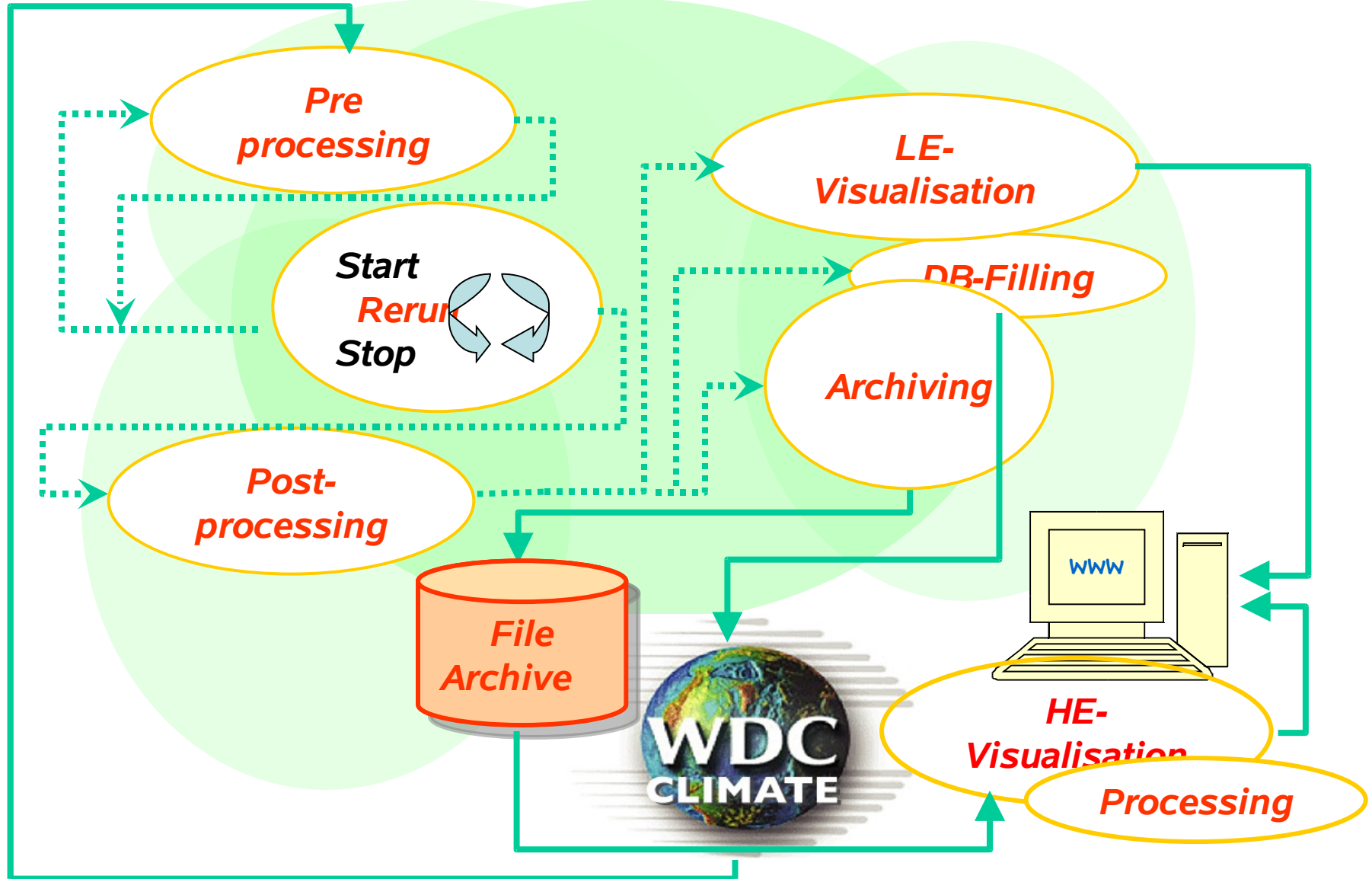
visualisation

archiving





Independence and interoperability of tasks





The Setup File

setup_*cplmod*_ID

- Specification of all configurable variables of the experiment
- Non configurable variables in complete_setup_*cplmod*.h

cplmod: coupled model

ID: experiment id

node: node name

model: component model

```
config_experiment.h
config_cplmod.h
config_timecontrol.h
config_postprocessing.h
config_postprocessing_model.h
config_archive.h
config_visualisation.h
config_visualisation_model.h
config_mpi_node.h
config_filesystem.h
config_site_node.h
config_commands_node.h
```

```
complete_setup_cplmod.h
```



The Runscript

Definitions

```
comments_ cplmod.h  
queue_commands_ node.h  
setup_ cplmod_ID  
complete_setup_ cplmod.h  
functions.h  
calendar.h
```

cplmod: coupled model
node: node name
ID: experiment ID
model: component model

Preprocessing

```
create_directories.h  
get_executables_ cplmod.h  
get_input_data_ model.h  
namelist_ model.h
```

for all component
models and the
coupler

Execution

```
launching_ cplmod_node.h  
save_output_ model.h
```

Postprocessing Job submission

```
postprocessing_ model.h  
submit_next_jobs.h
```



Runtime Control

expid.log

```

Wed Feb  2 10:46:36 MET 2005 : Beginning of Experiment D01b
Wed Feb  2 10:46:36 MET 2005 : 1 00010101 0:41880.siox3 -
start
Wed Feb  2 11:00:24 MET 2005 : 1 00010131 0:41880.siox3 - done
Wed Feb  2 11:02:14 MET 2005 : 2 00010201 0:41909.siox3 -
start
Wed Feb  2 11:14:01 MET 2005 : 2 00010228 0:41909.siox3 - done
Wed Feb  2 11:14:01 MET 2005 : Experiment over

```

real time date

job-number

job-id

simulated date

expid.date

0001 03 01

next year

next month

next day

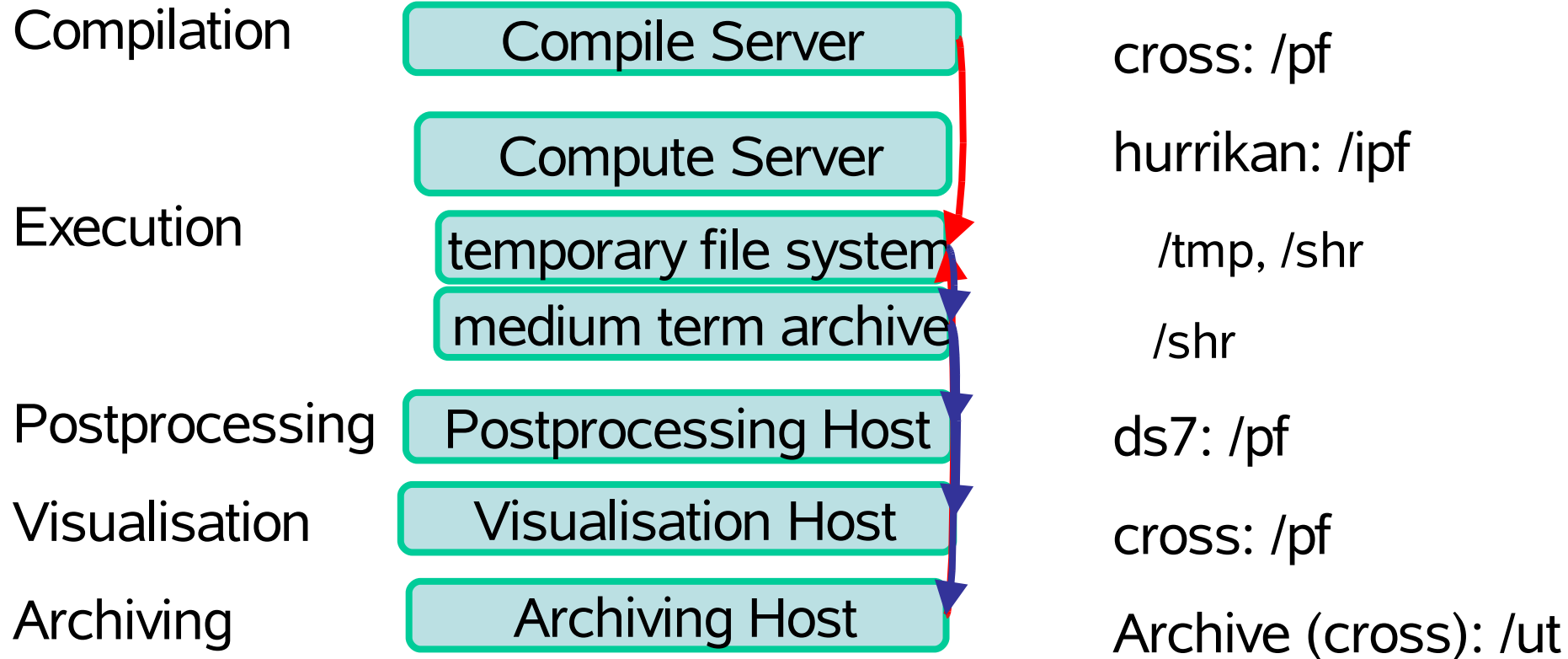
next job



File Systems of SRE

The file systems are specified in the setup file.

- home: permanent file system for scripts
- work: temporary working directory, time horizon of a run
- data: input, output and restart files, executables; capacity for big data files, time horizon of several runs, fast connection to "work"
- archive: model output, long term archive
- archive_in: initial files, long term archive



get executables and input



data transfer of output and processed data



Model configurations adapted to the SRE

(Coupled) Model	Component (<i>sub</i>) models
COSMOS-A	ECHAM5
COSMOS-O	MPIOM
COSMOS-AO	ECHAM5 + MPIOM
COSMOS-AOB	ECHAM5 + (MPIOM + <i>HAMOCC</i>)
COSMOS-ASOB	ECHAM5 + JSBACH + (MPIOM+ <i>HAMOCC</i>)
CLM	CLM (regional stand-alone model)
TOYCLIM	TOYATM + TOYOCE + TOYCHE



Model requirements

- Modularity of IMDI components
 - Usage of SRE without adaption to SCE is possible (executables must be at the correct place with the correct name)
- Adaption to the Standard Compile Environment (Source Code Management)
- Flexible source code : Control parameters (e.g. length of the simulation, the number of processors, exchange frequencies in coupled models) should not be hard-coded



Platforms supported by SRE

Currently supported

NEC SX-6

Linux i686

In progress

SunOS

Within the PRISM project

Cray X1

SGI IRIX64

IBM Power4

nodes

cs (hurrikan)

workstations at ZMAW

yang



Benefits

- Common look-and-feel
 - for all models
 - for all platforms
- Portability and modularity
- Profit from future developments
- Support (M&D and OASIS Team)
- Post-processing and visualisation tools
- Facilitation of model exchange
 - within a coupled configuration
 - between institutes



SRE Handbook (being updated)

⇒ **SVN:** <http://svn-mad.zmaw.de/svn/mad/Model/IMDI/tags/'tag'/util/running/doc>

⇒ **Web:**

<http://mad.zmaw.de/imdi>

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